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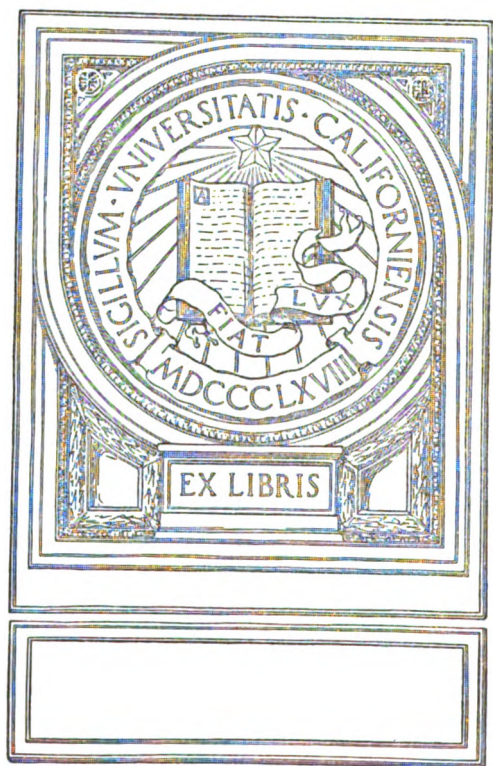
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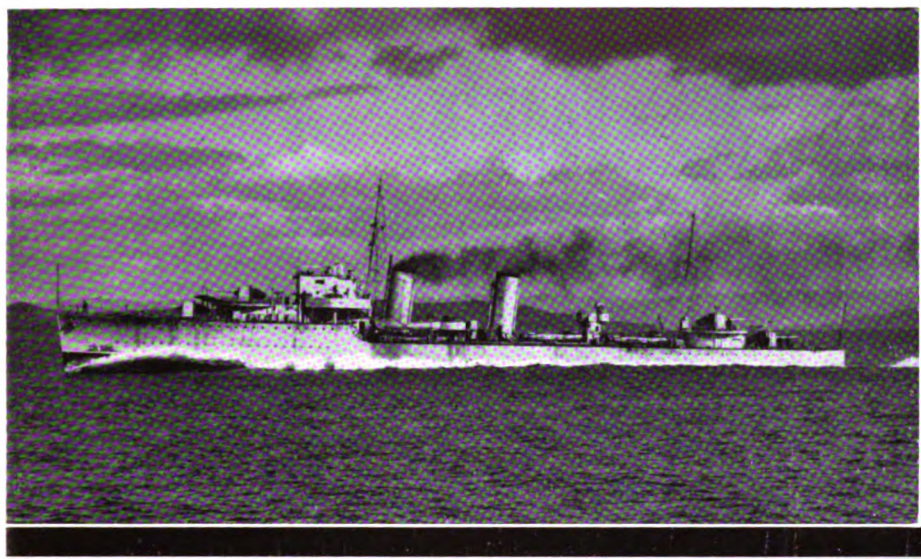


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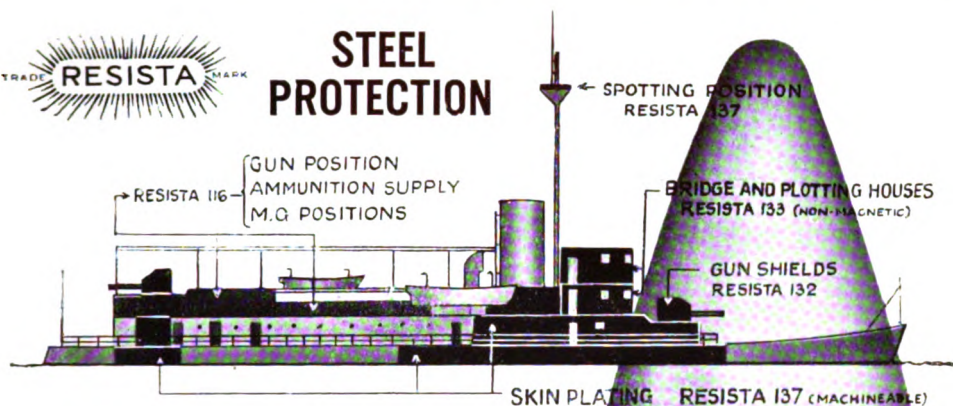
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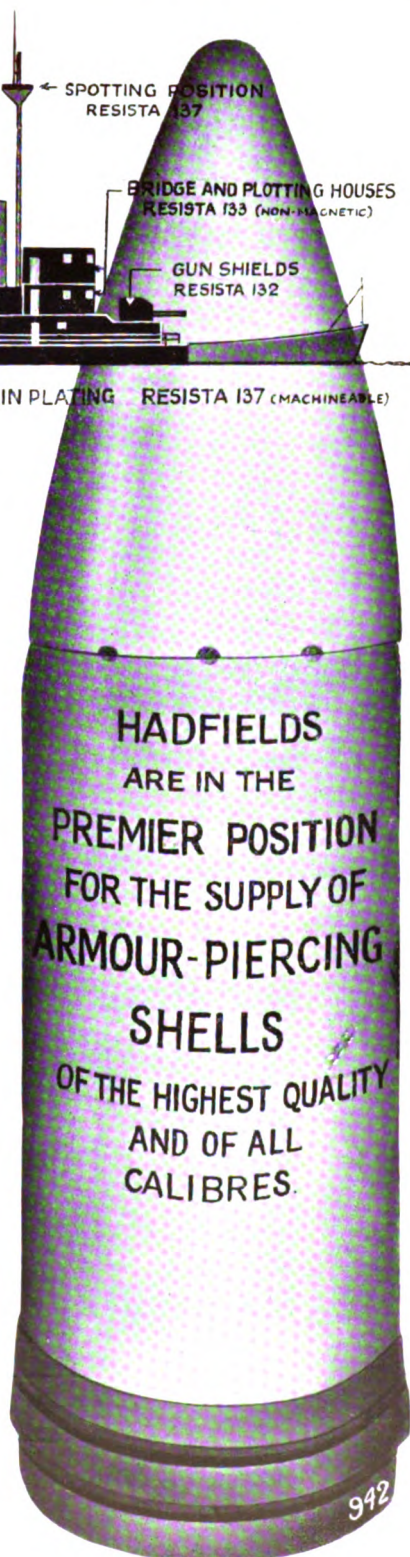
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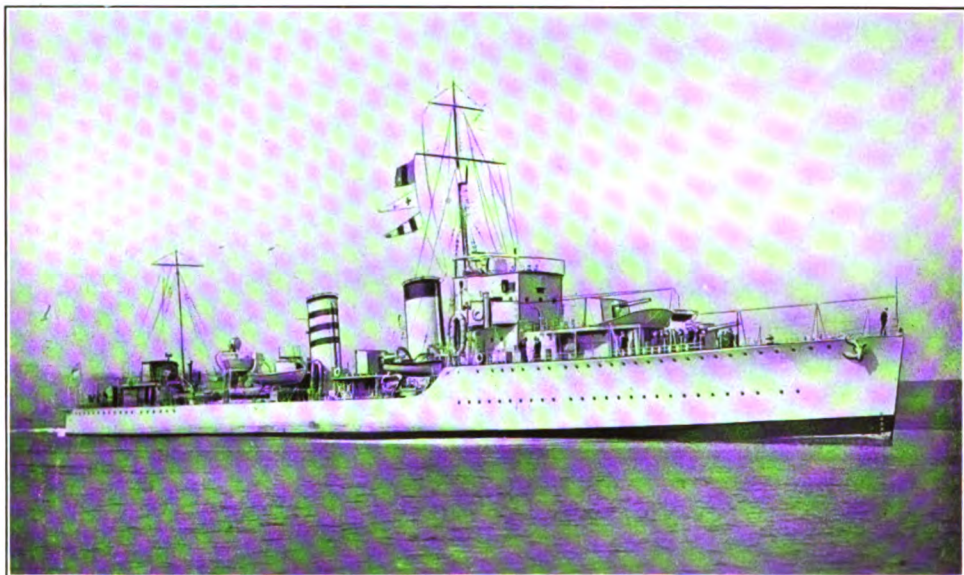
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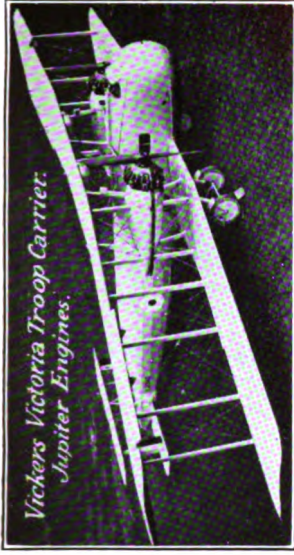
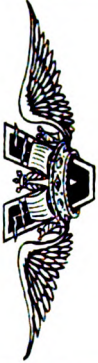
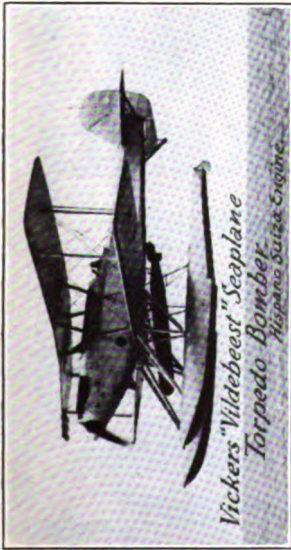


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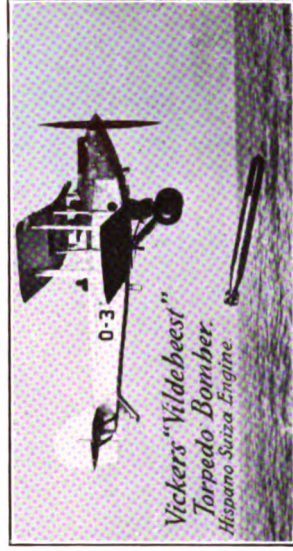
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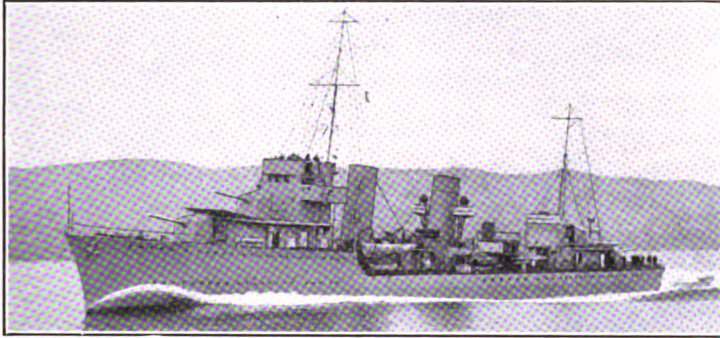
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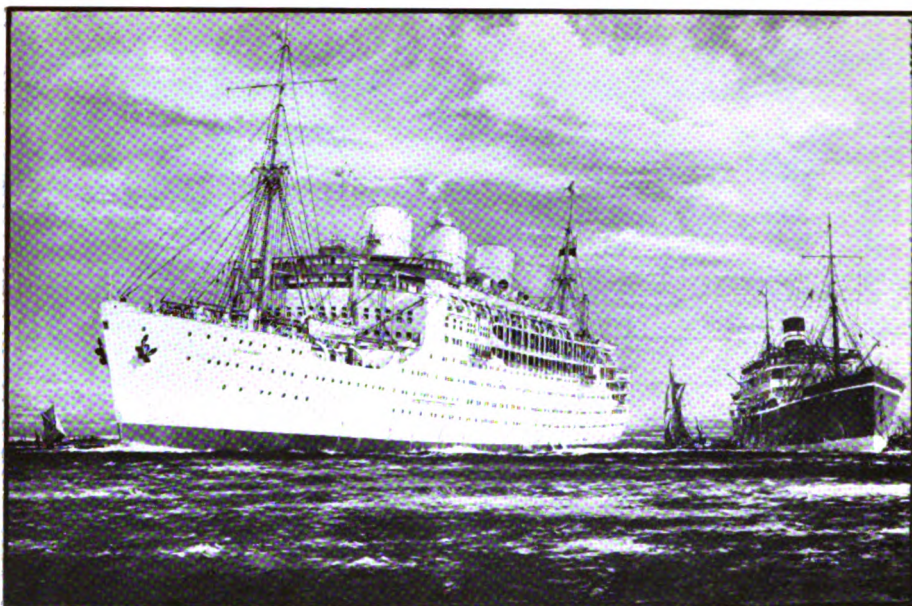
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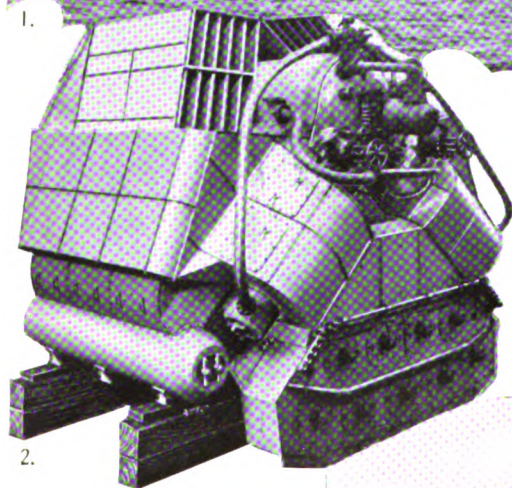
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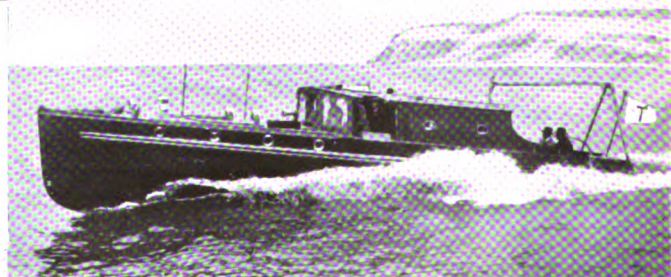
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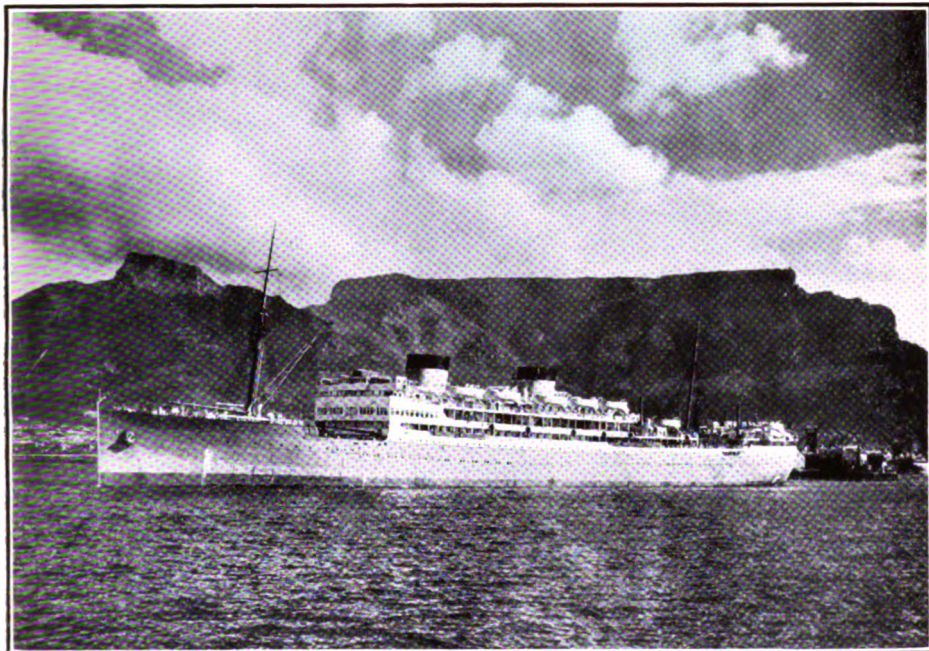


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EDITED BY  
COMMANDER CHARLES N. ROBINSON, R.N.  
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H. M. ROSS

UNIV. OF  
CALIFORNIA

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FORTY-FOURTH YEAR OF PUBLICATION.

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## PREFACE.

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At the end of a year in which there was held the first International Conference on Disarmament the nations showed no immediate intention to reduce their sea forces. Although proposals for limitation were both numerous and varied, the task of reconciling them into an agreement satisfactory to even a majority, proved insuperable. As the needs of each country for national defence differed, so did the degree of importance which each attached to particular arms or standards of strength. Nor did the events of the year tend to support the assertion that armaments are the primary cause of war. There was unrest in many parts of the world due to causes lying far deeper, and as the year progressed the clouds of suspicion and distrust on the international horizon showed no sign of being dissipated. In these circumstances, it is hardly to be wondered at that governments were reluctant to exchange the substance of their tried means of defence for the shadow of reliance upon international agreement, especially when history shows so many examples of the disregard of paper pacts.

In the clamour for a lead and an example, too little credit has been given to Great Britain for the drastic steps she has taken during the last fourteen years in reducing her naval strength. "They are steps," as the Right Hon. S. M. Bruce said at the Nelson Day dinner of the Navy League, "which might well be considered as having carried naval security, in so far as quantitative reductions are concerned, across the border-line that separates security from national risk. . . . There is no Power with a parallel naval responsibility to that of the United Kingdom which, in the light of such obligations, has made or proposed greater sacrifices." The assurance given by Mr. Baldwin at the Lord Mayor's Banquet that there will be no further unilateral disarmament so far as this country is concerned was generally welcomed, although it did not entirely relieve a very genuine anxiety about our naval preparedness. At the close of the year, there were signs of renewed activity in the shipyards, due to the putting in hand of work deferred on financial grounds from 1931.

The present issue of "Brassey's Naval and Shipping Annual," the forty-fourth which has appeared since the foundation of the work by the first Lord Brassey in 1886, will be found to follow the lines of those of recent years. The first half of the volume again

contains the special articles by writers of authority which make the work unique as an open forum for the discussion of maritime affairs, both naval and mercantile. A "Summary" which follows will be found to contain an epitome of these essays. It is again a pleasure to acknowledge the ready help and co-operation of former contributors to the "Annual." Sir George Thurston, for so many years the Chief Constructor of Messrs. Vickers-Armstrongs, deals with a subject which has become of special importance with the building of the German Deutschland and the French Dunkerque—the design of the future capital ship. Continuing the series of articles on the personnel, which has already included essays on the R.N. Medical Service, by Surgeon Rear-Admiral C. M. Beadnell, and the R.N. Accountant Branch, by Paymaster Rear-Admiral A. C. Ransom, there is a chapter in this issue on the Instructor and Schoolmaster Branches, by Instructor Captain G. V. Rayment, C.B.E., B.A., Professor of Navigation and Dean of the R.N. College, Greenwich. Former contributors again deal with the progress of the British and Foreign Navies, Comparative Strength, and the Disarmament Conference. Taken together, their work will be found to represent the salient points of the present naval situation.

Grave and urgent problems still face the British Merchant Service, some of which, such as those which result from the subsidising of shipping in other countries, are beyond its own powers to solve. The present position is indicated, on the one hand, by Mr. John P. Taylor, who reviews the relative standing of the world's merchant fleets, and, on the other, by Mr. Cuthbert Maughan, who deals with the report on policy of the Chamber of Shipping. That the depression of 1932 was also felt abroad is shown by the article on the French Mercantile Marine, by M. Jean Marie, Ingénieur en Chef du Génie Maritime, whom we are glad to welcome among other distinguished foreign writers for the "Annual." Closely allied to these essays is one by an eminent constructor, who prefers to remain anonymous, on "The Deterioration of Ships." The two series on the great shipping companies and on British ports are continued with articles on the Royal Mail Steam Packet Company, by Mr. Howell Davies, and the Port of Hull, by Mr. H. S. Cole, Eastern Area Docks Superintendent of the L.N.E. Railway Company, who are the sole proprietors of the Hull docks. We are indebted to Sir Charles Hipwood, formerly of the Mercantile Marine Department, Board of Trade, for a descriptive article on the two Conventions on the Safety of Life at Sea and the Load Line, which came into force on January 1, 1933. Former contributors to the "Annual" write on the North Atlantic passenger trade, on pleasure cruising, on marine machinery, on the notable merchant ships of the year, and on marine aviation.



By permission of the Director of Naval Construction, Mr. L. T. Carter, R.C.N.C., has again taken charge of the Naval Reference Section. The grouping of aircraft carriers in separate tables will be found useful for purposes of reference and comparison. The plans for which he is responsible form a very complete summary of the principal warships of the world, and include several important units still under construction. Of the new silhouettes, that of the new French cruiser *Algérie* is, perhaps, the most interesting, as showing important differences from earlier cruisers. The tables of comparative naval strength are amplified by footnotes, and the cruiser totals have been divided to indicate those ships with guns of 6-inch calibre and below, and those above 6-inch. The mercantile reference tables will also be found very full. The photographic illustrations to the volume include the latest important war and merchant ships. Among the former is that of the *Leander*, the first of the post-London 6-inch-gun cruisers of 7,000 tons in the Royal Navy.

To the many authorities and correspondents, too numerous to mention individually, who have again assisted us, we offer our sincere thanks. Particularly are we indebted to the various government departments, and to the Naval Attachés of foreign Powers in London, for their courteous co-operation in supplying or verifying information. It is largely due to them that the "Annual" maintains its unique position among the world's reference works.

THE EDITORS.

*December, 1932.*

## SUMMARY OF CONTENTS.

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THE influence of the financial crisis of 1931 on naval construction during 1932 is shown in the opening chapter, on the "Naval Forces of the British Empire." In order to effect economies this country has gone beyond its Treaty obligations. It had already reduced the number of ships building; it has now retarded the rate of construction. On the other hand, the scrapping of the older ships under the London Treaty has been accelerated. Changes in administration are reviewed, including the setting up of a Directorate of Personal Services at the Admiralty. Lack of opportunity for sea time and for gaining experience in command is also discussed. Examples are given of the value of the Navy in peace time for police duties all over the world, to help in restoring order, to afford succour in distress, and for humanitarian purposes generally.

In reviewing the progress of foreign navies, Captain Edward Altham, C.B., notes that the more disarmament is discussed, the more acute become the differences between what each nation believes to be essential for security. After the French reply with a 26,500-ton ship to the three German *Deutschlands*, we may yet be back to pre-War conditions of competition in capital ship design. The United States continues to build the largest type of cruiser. France and Italy continue to build large destroyers which are in reality small cruisers. Some notable additions are being made to the fleets of the minor Powers; Yugoslavia, for example, has a flotilla leader heavier and more powerfully armed than the limits agreed upon by Great Britain, the United States, and Japan at the London Conference of 1930. Portugal and Yugoslavia were the only foreign countries for which ships were built, ordered, or completed during 1932 by British firms.

Dealing with comparative naval strength in Chapter III, Mr. G. H. Hurford points out the somewhat ironical coincidence that just as the battleship fleets of Great Britain, the United States, and Japan are being scaled down under the London Treaty of 1930, competition in capital ships is resumed between France and Germany. A further decline in British cruiser strength is noted. The 51 ships in this class include only 43 within the age limit of 16 years. Figures prepared by the U.S. Navy Department are quoted to show the extent to which the three principal Powers will be short of their allotted Treaty strength in December, 1936. The comparative strength in the naval personnel of the principal Powers is given, and it is shown that Great Britain no longer possesses a superiority in naval reserves.

The work of the Disarmament Conference, which began at Geneva on February 2, is analysed by Captain A. C. Dewar. He summarises the original proposals to the Conference, and shows that two currents of opinion were discernible, one on the side of France for the League to have executive power and an international force to maintain peace; the other the Anglo-American-Italian proposals asking for a measure of direct disarmament. After the abortive discussions as to what armaments were most specifically offensive, there came President Hoover's proposals of June 22 for a one-third cut in armies and navies, and the British counter-proposals of July 7 announced by Mr. Baldwin. The Conference adjourned in a troubled atmosphere on July 28. A month later Germany withdrew, unless her right to equality in armaments was conceded, and her claim is discussed by Captain Dewar, who summarises the position as it was after the presentation of the British policy by Sir John Simon on November 17, and before the announcement of the Japanese proposals on December 10.

In Chapter V, the instructor officers and schoolmasters of the Navy are dealt with. Neither of these branches is much known outside the Service, and neither has a counterpart in other navies. Their history and development is traced from the time, in the seventeenth century, when schoolmasters (with the pay of a midshipman) or chaplains received a private allowance from the captains of ships to teach the young gentlemen whom the captains took to sea with them. The title of schoolmaster was altered to that of naval instructor in 1842; appointment by commission, and the distinctive blue stripe on the uniform, were instituted in 1861; and eventually the Instructor Branch was reconstituted in its present form in 1919. The Schoolmaster Branch, which teaches school subjects to men as the Instructor Branch does to officers, is also described.

A chapter which should provoke much discussion is that by Sir George Thurston on the future capital ship. After reviewing the salient features of the latest representative battleships in the principal navies, he puts forward a design for a ship of 25,000 tons (the limit suggested by Great Britain at Geneva), which would mount twelve 12-inch guns and be able to steam at sea at 22 knots. Barbette armour of 14-inch, and side armour of 12-inch, with a 16-inch conning tower, are provided for, and special attention is paid to under-water protection. Although considered in some circles to be getting obsolete, the battleship type, as Sir George remarks, "has every appearance of still maintaining its hitherto paramount power."

#### MERCHANT SHIPPING SECTION.

Mr. John P. Taylor, who again writes on the standing of the world's merchant fleets, shows that the amount of tonnage lying idle was estimated to reach the enormous total of 13½ million tons. Net increases of tonnage were recorded last year in Norway, Danzig, Soviet Russia, Greece, and Italy. The principal decreases were in



Great Britain and Ireland, Holland, the United States, and Germany. Sailing ship tonnage now barely reaches 2 per cent. of the world total. Motorship tonnage is the only class showing a progressive increase. There is a decline in the ratio of loss. The average yearly percentage of steam tonnage lost in 1927-31 was only 0.68 per cent., whereas during the years 1909-1931 it was nearly 1.17 per cent.

In Chapter VIII, Mr. Cuthbert Maughan reviews the work and analyses the report of the committee appointed in 1932 by the Chamber of Shipping to advise generally on policy. He emphasises that the various forms of State-assisted competition are regarded very seriously by the British shipping industry. The abandonment of these forms of competition and the reversion of shipping to ordinary commercial methods of operation would be welcome, and would assist a revival of international commerce.

On January 1, 1933, there came into operation the two conventions on the safety of life at sea and the load-line, which were ratified by the majority of the contracting governments on October 1, 1932. The significance and bearing of these new codes, which mark a definite turning-point in the history of shipping, are dealt with in an article by Sir Charles Hipwood. He shows how both Governments and firms have come to recognise that, while there is no such thing as absolute safety, it pays to have as much safety as economic working will admit.

Mr. Richard Beynon, following his chapter in the 1932 "Annual" on the Cunard Line, writes on the North Atlantic passenger trade, now in a state of arrested development. In 1931 west-bound traffic was less than 20 per cent. of that in 1913, and the proportion of third-class only 8 per cent. The trade, in fact, has experienced the full force of the economic depression, and British lines have suffered to a greater extent than the Continental; but history is only repeating itself, and the hope is encouraged that the present set-back may prove only temporary.

The vogue of the pleasure cruise, so prominent during 1932, is discussed in a racy article by "Viator," entitled "This Cruising." Shipping managements, in deciding to try a few extra cruises, found a public more eager and responsive than the most sanguine had dared to anticipate, and big mail carriers were put on week-end cruising. A new technique of catering and entertainment is being established, and the short-term, low-fare holiday cruise will find its own niche in the cruising business.

The series in earlier "Annuals" on the great British shipping lines is continued by Mr. Howell Davies, who writes on The Royal Mail Steam Packet Company. In 1932, the ninety-fourth year of its incorporation, the Company's fleet was transferred to a new operating company, Royal Mail Lines, Ltd., with Lord Essendon as chairman. The R.M.S.P. Co. was incorporated by Royal Charter in 1839, and received its first mail contract in 1840, not with the Postmaster-General, but with the Lords of the Admiralty, and one clause in the agreement was that the new mail steamers should in the event of war be made auxiliary to the ships of the Royal Navy.

To the series of articles on foreign merchant marines, which has included Japan (1930), Italy (1931), and America (1932), there is now added one on France, by M. Jean Marie, Ingénieur en Chef du Génie Maritime. In addition to the general depression, the tariff protective measures adopted to favour French agriculture and industry have served to impede sea trade. Since 1918 there has been, in France, no State aid for merchant shipping except for the tanker fleet, the tonnage of which had to be increased to meet national needs.

To the series on notable ports, represented last year by Bristol, there is added a chapter on Hull, by the Eastern Area Docks Superintendent of the L.N.E.R., Mr. H. S. Cole. He traces the early history of this great eastern gateway of England, and reviews its present industries. Incidentally, Hull is the largest seed-crushing centre in the world. It is also, of course, the greatest fishing port in the country.

The usual review of progress in Mercantile Marine machinery is again supplied by Mr. R. J. Butler, M.I.N.A., who considers that possibly the outstanding feature of the year was the production of a number of modified designs of steam engines by leading manufacturers. Reference is made to the experiment of the Cunard Company in running their *Scythia* partially on an emulsified fuel of coal dust suspended in oil, and to the principal foreign ships put into service during the year. A serious note is sounded in conclusion respecting the falling off in apprenticeship owing to the depressed conditions, so that in a few years there will be a scarcity of trained engineers available to carry on the traditions of their predecessors.

A chapter always looked for is that on notable merchant ships of the year. Reference is made to the *Rex* and *Conte di Savoia*, the largest ships completed; and to the launching by France of the first ship over 1,000 ft. in length.

A timely subject under present conditions is discussed by "Constructor" in his essay on "The Deterioration of Ships." He traces the factors which may interfere with the normal anticipation that 25 years of service will be obtained from a ship. Immediately she is completed deterioration sets in. Special reference is made to the erosion of propeller blades. In general, the structure of a ship outlasts her real usefulness; development in type is a larger factor in rendering her obsolete than structural decay.

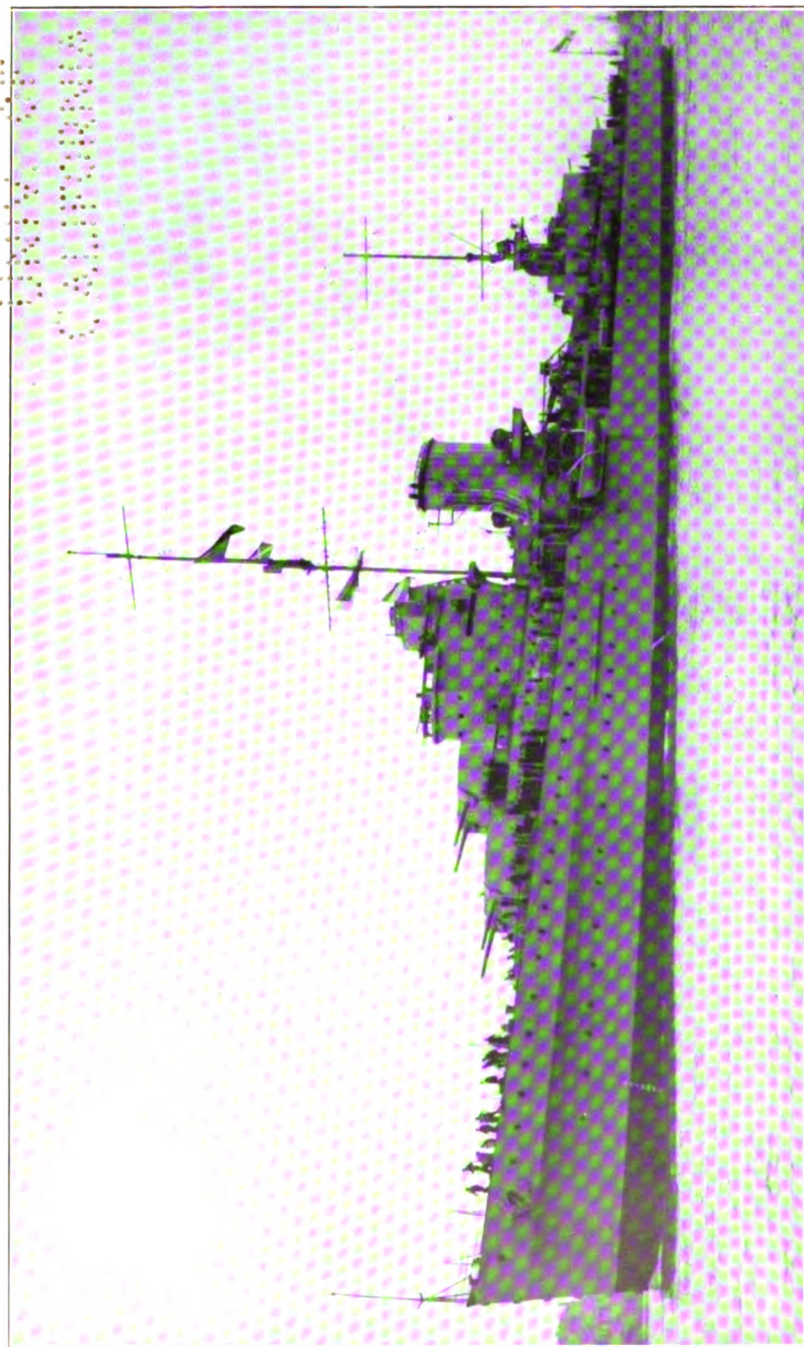
As in past years, the Editor of *Flight* discusses the progress of marine aviation, both naval and commercial. After reviewing briefly the present equipment of the Fleet Air Arm and the R.A.F. squadrons for coast defence, he describes the new Short flying boat, the largest ever built, with a total loaded weight of over 30 tons, as the greatest British aeronautical achievement of 1932. Except for the Short "*Scipio*" class, no new civil flying boat was produced by a British firm in 1932. Lists of British and foreign naval aircraft types will be found in the Naval Reference Section.

## NAVAL SECTION.





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*(Photo by Abrahams and Sons, Devonport.)*

**THE LATEST COMPLETED BRITISH CRUISER, H.M.S. LEANDER, 7,000 TONS.**

**EIGHT 6-IN. GUNS.**

*Due to Commission for Service, February 27, 1933.*

# UNIV. OF CHAPTER I. ALABAMA

## NAVAL FORCES OF THE BRITISH EMPIRE.

THE future of the British Navy is still in suspense. The proposals of Mr. Hoover and those of the British Government to the Disarmament Conference contemplated measures which would reduce the strength of the Fleet by about one-third. If such measures were to be applied under present conditions they would create a sense of insecurity which could hardly be contemplated without grave apprehension. French proposals at the Disarmament Conference went still further by suggesting that what remained of the British Fleet should be held at the disposal of the League of Nations to enforce the will of the latter. On a report to the League that an act of aggression had been committed anywhere, the Council might order that international action of a penal character be taken against the offender. This would mean the coercion of aggressors by means of a blockade, which could only become effective by the use of a strong naval force. Such action would be instituted by a majority vote, made up of representatives of countries which have little or no knowledge of maritime affairs nor any appreciation of the objects with which an island Power maintains a navy. The curious fact is that proposals of such a character, whereby Great Britain would at the same time reduce her sea strength and add to her commitments, are put forward at a time when, as Mr. Lloyd George said in an address to the Peace Society in October, "There are now more serious misunderstandings of the kind that make war than I can ever recall."

The serious condition of affairs, so far as naval strength is concerned, was recognised in several speeches by prominent men during 1932. The First Lord, Sir Bolton Eyres-Monsell, uttered a warning when he introduced the Navy Estimates on March 7, 1932, to those who thought we should continually indulge in unilateral disarmament. He quoted some figures given in the previous month by Signor Grandi, that from 1925 to 1930 the world's expenditure on armaments had increased by £126,000,000, and pointed out that during those years the decrease on our own Navy was £8,000,000. On another occasion, during a debate in the House of Commons on November 30, 1932, Sir Bolton Eyres-Monsell showed how our requirements, and our responsibilities, are unique among the nations of the world, and what we have done under the Washington and London Naval Treaties. "There will," he added, "be no further unilateral reduction." This was in reply to a motion of Sir Bertram Falle, Member for Portsmouth (N.), who, in the course of his speech said :—

We have weakened our Navy to no purpose. We have weakened it to please a certain nation which will give us no help and no thanks. It can only dictate to us. . . . Tell the country that we have only a remnant of our great Navy, and that not



one single class of ships is sufficient in itself, in numbers or in power. Tell the country that the Navy does not stand where it did, that it is not strong enough for its duties even in peace, and not strong enough in personnel or in *matériel*, nor, I regret to say, is it contented enough at this moment to play the rôle that it has played in the past. It is a disappearing force..

A significant reference was that of the Prime Minister in a speech in London on October 17, 1932. Mr. Ramsay MacDonald said :—

I want disarmament that will be a real contribution to the present problem of establishing peace. I am not sure that we have not perhaps played the part of the peacemaker a little too long. . . . The keynote of our policy is not rearmament, but disarmament.\*

Mr. Baldwin, at the Lord Mayor's Banquet at the Guildhall, on November 9, 1932, said that he need not emphasise in the City of London the extent to which His Majesty's Government had not only taken up disarmament, but had put it into practice. "The time has now come to an end," he added, "when Great Britain can proceed with unilateral disarmament." On the following evening Mr. Baldwin made an important speech on the subject in the House of Commons, during which he said :—

Disarmament, in my view, will not stop war; it is a matter of the will to peace. . . . Will any form of prohibition, whether by convention, treaty, agreement, or anything you like . . . be effective in war? Quite frankly, I doubt it, and, in doubting it I make no reflection on the good faith of either ourselves or any other country. If a man has a potential weapon and has his back to the wall and is going to be killed, he will use that weapon whatever it is and whatever undertaking he has given about it. The experience has shown us that the stern test of war will break down all conventions.†

Sir John Simon, the Foreign Secretary, in outlining the British policy at the Disarmament Conference on November 17, said : "My own country in recent years has effected immense reductions in armaments, and cannot go further without general agreement."

Yet in spite of all these affirmations, the reduction of the Fleet still goes on, owing to the inadequate measures taken for its maintenance. New ships are not being built to replace those of the War period which have reached, or are reaching, the limit of their effectiveness within a comparatively short period. Even the limited measure of strength allowed in the London Treaty is not being maintained. The Secretary of the United States Navy, in his Annual Report published on December 8, 1932, admitted that Great Britain will be heavily below Treaty strength in 1936 in destroyers, submarines, light cruisers and aircraft carriers.

The past year has been notable for the reconsideration of a number of problems affecting the personnel of the Fleet, and particularly for the revival of a suggestion to provide some sailing ships for the training of officers and men. Opinion on this subject, as was indicated by a lecture at the Royal United Service Institution on October 5 by the Captain-Superintendent of the mercantile training ship Worcester, is very much divided. Other projects affecting the personnel, including the re-institution of a cadets' seagoing cruiser, are referred to in the pages which follow.

\* *The Times*, October 18, 1932.

† *The Times*, November 11, 1932.

## I.—THE BRITISH NAVY.

## CRUISER CONSTRUCTION.

No cruiser was completed for the Royal Navy during 1932. Only once before since the construction of the vessels of the War programmes was finished has a year passed without some cruiser being passed into service. The failure to complete a ship in 1932 was the sequel to the action taken by the Labour Government in January, 1930, as a gesture to encourage the Naval Conference, in cancelling the building of the *Surrey* and the *Northumberland*.

The rate of construction tends to become more prolonged, owing to the cuts in the Estimates. Not only is the time which is allowed to elapse before the laying down of a ship on the increase, but the annual appropriations during her building show a decline, which means a slower rate of progress. The 1932 Estimates appeared with a new programme of three cruisers, but no money whatever was included for them up to March 31, 1933. The second instalments for the *Amphion*, *Arethusa*, and *Ajax*, authorised in 1931, amounted to between £184,565 and £173,713 each; whereas in the previous year's Estimates, the second instalments for the *Achilles*, *Neptune*, and *Orion*, authorised in 1930, amounted to between £326,579 and £370,690, or more than twice as much. These figures lend point to the remark of Admiral of the Fleet Lord Wester Wemyss at the annual meeting of the Institution of Naval Architects in March, 1932, that: "It was true that our treaty obligations had tied our hands, but we had in some directions gone beyond those obligations, and had, in our endeavour to effect economies, reduced our naval strength below the safety limit."

Speaking on the Navy Estimates in the House of Commons on March 7, 1932, the First Lord, Sir Bolton Eyres-Monsell, said that since the War we had built only seventeen cruisers; in the last four years only five, whereas it was absolutely essential that we should have three a year to keep our Fleet on an even keel. Sir Bolton also showed that we had laid down only four submarines in the eight years up to 1926. No sloops, gunboats, or minesweepers were laid down between 1917 and 1926, and in the year 1931-32 we had disposed of 74,000 tons of warships and barely completed 26,000 tons. "With these facts in mind," added the First Lord, "it must be apparent that there can be no further slowing down of our building programme, and a steady replacement programme must be unflinchingly pursued."

The manner in which the appropriations for new cruisers have been cut is indicated in the table over-page, which is compiled from the Navy Estimates of the last six years.

It will be seen from these figures that the appropriations for the second year were reduced by about one-half in the case of the *Amphion* group of the 1931 programme; and that the first year appropriations, usually called "token sums" dwindled to nothing

in the case of the ships of the 1932 programme, for which, up to November, 1932, no money whatever had been voted.

Pro-gramme.	Ship.	Sums Voted.			
		First Year.	Second Year.	Thir'd Year.	Fourth Year.
1927	Exeter	£ 8,586	£ 472,659	£ 572,223	£ 492,929
1929	Leander	7,678	265,226	622,539	622,908
1930	Archilles	82	326,579	692,566	
	Neptune	1,462	370,690	619,208	
	Orion	1,325	335,287	641,427	
1931	Amphion	1,380	173,713		
	Arethusa	1,285	155,501		
	Ajax	15,108	134,565		
1932	1st ship	—			
	2nd ship	—			
	3rd ship	—			

#### CRUISER PROGRAMMES, 1927-1932.

The following table summarises the position in regard to the construction of cruisers for the Royal Navy under the programmes of the last six years :—

Pro-gramme.	Ships.	Tons.	Begun.	Remarks.
1927	Exeter	8,400	Aug. 1928	Completed, July 1931.
1928	(Surrey)	10,000	1929	Cancelled, Jan. 1930.
1929	(Northumberland) Leander	7,000	Sept. 1930	Launched, Sept. 24, 1931. To complete, Feb. 1933.
1930	{ Achilles Neptune Orion }	7,000	June-Sept. 1931	To complete, 1933-1934.
1931	{ Amphion Ajax Arethusa }	7,000	} Late 1932 1933	
1932	2 ships	5,500		
	1 ship	7,000		
		5,500		

#### DELAYED SHIPBUILDING.

The outstanding feature of shipbuilding for the Royal Navy during 1932 was the postponement of the start of the 1931 programme for six months, by which £1,300,000 was saved by the Admiralty as one of the contributions towards balancing the Budget. The First Lord announced this when introducing the Navy Estimates for 1932-33 on March 7, 1932. " By far the worst feature of these

Estimates," he said, "is the postponement of last year's programme." Instead of being started in March, 1932, it was put off until September of that year. The effect of this was felt most by the shipyards. It was not so urgent for the Navy, because as the First Lord explained we have got to have the ships allowed us by 1936 under the Treaty of London, and "there is no doubt we shall have them," added Sir Bolton Eyres-Monsell. The First Lord said that he "had included a sum in this year's Estimates (1932-33) for starting the 1932 building programme at the normal time in March of next year," but where this sum is provided is not clear from the official figures. The postponement is of great concern to the shipyards, which were already having serious difficulties. The First Lord assured them of his very deepest sympathy.

Only the very grave financial emergency could justify such a step. The programmes since 1929 have been cut to the bone. If their execution is also being interfered with, and the interference continues for any length of time, it will completely undermine the position, already hazardous, facing the Royal Navy in 1936. It should also be pointed out that what the First Lord called the "normal time" for starting a programme—March of the year after authorisation—has only become so since 1925. It was not formerly the practice to defer laying down ships until the very last month (or later) of the year in which they first appeared in the Estimates. As an example, when cruiser construction was resumed after the war, and the five ships of the "Kent" class were authorised, in March, 1924, they were ordered forthwith and their keels laid between September 30 and November 15, 1924. It is sound policy to translate design into the finished ship at the earliest possible moment. Thereby experience on trial is available much earlier, the personnel become acquainted with newer material, and the country gets an earlier return for the money invested in building.

#### CRUISER PROGRAMMES.

The 1932 programme, to be ordered in March, 1933, includes three cruisers, as in the three previous years, this being the normal amount of replacement building under the Treaty. One cruiser ("Leander" class) will be built at Devonport; and two (one "Leander" class and one "Arethusa" class) by contract.

Orders for the three cruisers of the 1931 programme were announced by the Admiralty on August 31, 1932. Only one ship of this programme was put out to contract. This is the Ajax, the hull and machinery of which will be built by Vickers-Armstrongs, Ltd., at Barrow. A sister-ship will be the Amphion, at Portsmouth Dockyard, the engines and boilers of which will be manufactured by Beardmore and Co., Ltd., Dalmuir. These will be of the larger 7,000-ton 6-in. gun class, of which the Leander is the type-ship. The remaining vessel will be of a lighter 6-in. class, between 5,000 and 6,000 tons. She will be called the Arethusa, will be built at Chatham Dockyard, and her machinery will be supplied by the Parsons Marine Steam Turbine Co., Ltd.



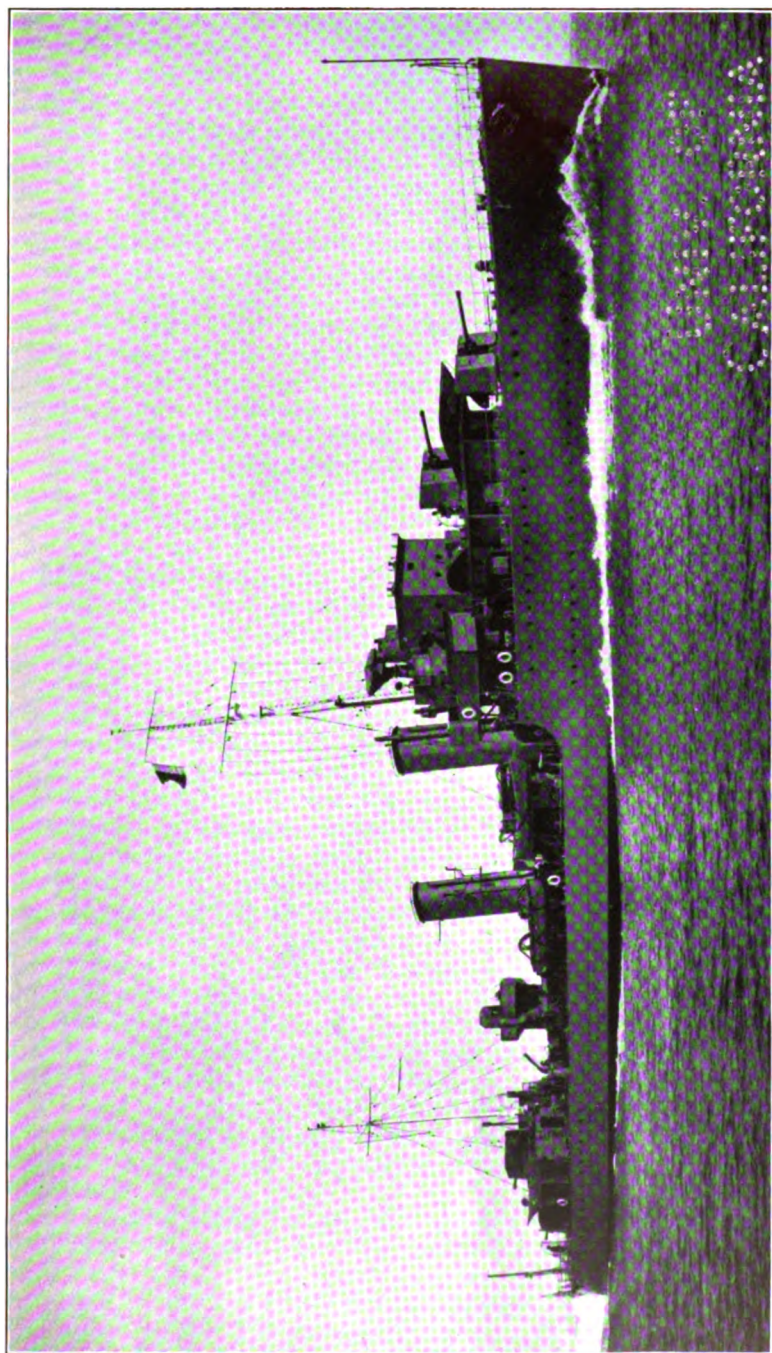
Of the three cruisers of the 1930 programme, the contract-built ship, H.M.S. Achilles, was launched at Birkenhead by Messrs. Cammell Laird and Co., on September 1, 1932. Lady Stanley, wife of Lord Stanley, Parliamentary Secretary to the Admiralty, performed the naming ceremony. The Achilles has a length of about 520 ft., and at the load draught she will have a standard displacement of about 7,000 tons. Her main armament will consist of eight 6-in. guns, and in addition, she will carry four 4-in. anti-aircraft guns and four 3-pounders. The propelling machinery has been constructed and is being installed by the builders of the hull. It consists of single reduction geared turbines, taking higher temperature high-pressure steam from oil-fired water-tube boilers. The shaft horsepower developed will be about 72,000, which, it is estimated, will give the cruiser a speed of 32½ knots. By way of comparison it is interesting to recall that the last cruiser Achilles, which served in the Grand Fleet during the War, was 480 ft. long, with a displacement of 13,550 tons. In her main armament were six 9·2-in. guns, and she also had four 7·5-in., and twenty-four 3-pounders. Her propelling machinery was of the reciprocating type, and she had coal-fired boilers. The indicated horse-power developed on trial was 23,275, giving a speed of 23·27 knots. The two dockyard ships, the Neptune (Portsmouth) and Orion (Devonport) are due to be completed in 1933-4. They are being engined by the Parsons Marine Steam Turbine Company and Vickers-Armstrongs respectively. All three ships are of the "Leander" class, and the Orion was launched on November 24, 1932.

The 1929 programme was reduced by the late Labour Cabinet from three ships to one. This is the Leander, laid down in September, 1930, launched in September, 1931, and commissioned for trials on November 25, 1932. She is due to enter service about February, 1933, joining the Home Fleet in place of the Norfolk, which has gone to the West Indies.

At the moment, therefore, cruiser building for the Royal Navy is connected with ten ships, one at the trial stage, three at the launching stage, three just ordered, and three projected and to be laid down in 1933. No new ship of this class has been completed since the Exeter, in the spring of 1931. The endurance of the Exeter at economical speed is 10,000 sea miles.

#### DESTROYER PROGRAMMES.

When introducing the 1932-33 Navy Estimates, the First Lord showed that we were not building up to what we were allowed to do by the London Treaty. Under the strict limits of that pact we could build two flotillas a year at the present moment, instead of which we are building one. Sir Bolton explained that the Admiralty preferred at this moment to fix on one flotilla a year in order to spread the construction of destroyers evenly over the whole of our replacement period. A concentrated programme now of destroyers would only reproduce in the future the difficulty under which the Admiralty were now suffering, whereby a great many more destroyers



*(Photo by Beken and Son, Conces.)*

**H.M. FLOTILLA LEADER KEMPENFELT, 1,390 TONS.**

*Commissioned at Devonport, June 7, 1932.*

*(By courtesy of the builders, J. Samuel White & Co., Ltd.)*



became due for replacement than could be replaced by the normal annual programme. "In addition," said the First Lord, "this policy of one flotilla a year at the moment was preferred by the Admiralty because they hoped for a satisfactory settlement of some of these questions on which destroyers depend at Geneva, which they hoped very much might bring all the principal Powers within the ambit of the London Naval Treaty." The hope remains unrealised.

Six groups of destroyers have been built or authorised since the replacement of this class was started under the 1927 Estimates. They involve five and a half flotillas, as the flotilla sanctioned under the 1929 programme was reduced by one-half by the late Labour Ministry. The Codrington and destroyers of the "Acasta" class (1927 Estimates) now form the Third Flotilla, Mediterranean Station. The Keith and destroyers of the "Beagle" class (1928) form the Fourth Flotilla on the same station. The Kempenfelt and destroyers of the "Crusader" class (1929) were completed during 1932 and attained on trials an average speed of  $36\frac{1}{2}$  knots with about 36,400 s.h.p. They were allocated to the Second Flotilla, Home Fleet, which was completed by four old destroyers of the "V" type. The Duncan and destroyers of the "Defender" class (1930) were launched during the spring of 1932. The Exmouth and destroyers of the "Encounter" class (1931) were ordered in September, 1932. The leader and eight destroyers of the 1932 Navy Estimates are not yet named, and will not be begun until about March, 1933.

Contracts for the flotilla of the 1931 programme were announced by the Admiralty on September 20. They showed that the work had been divided as equitably as possible among the areas concerned, so as to assist the employment situation. Messrs. William Denny and Bros., Ltd., Dumbarton, who had not had a major contract of this kind since the war, received orders for the hulls and machinery for two destroyers, the Echo and Eclipse. Another firm in the Clyde district who received a similar order was Scott's Shipbuilding and Engineering Co., Ltd., Greenock, for the Escapade and Escort. They had not received a similar order since the programme of 1927, under which they built the Anthony and Ardent. Four other destroyers were ordered on the Tyne. Messrs. Hawthorn Leslie and Co., Hebburn, will build the hulls and machinery of two, the Electra and Encounter; and Swan Hunter and Wigham Richardson, Ltd., Wallsend, will build the hulls of two others, the Esk and Express, which will be engined by the Wallsend Slipway and Engineering Co. The order for the machinery of the Exmouth, to be built at Portsmouth Dockyard, was allotted to John Brown and Co., Ltd., Clydebank.

The flotilla leader Duncan was the first ship of this type to be built in a public yard. She was floated out of dock at Portsmouth on July 7, 1932. Formerly the construction of such vessels was entrusted to private firms who had specialised in the building of high-speed craft. The launching dates of the destroyers of the 1930 programme were as follow: Defender and Diamond, Vickers-Armstrongs, Barrow, April 7 and 8, 1932; Daring and Decoy, Thornycrofts, April 7 and June 7, 1932; Dainty and Delight,



Fairfield Company, May 3 and June 2, 1932; Diana and Duchess, Palmers' Company, June 16 and July 19, 1932. On trial in September, 1932, the Daring made a speed of 38·2 knots.

#### SUBMARINE PROGRAMMES.

The replacement programme for submarines, started under the 1926 Navy Estimates, at the rate of six vessels a year, was reduced to four vessels in 1928, and to three in 1929, since when three vessels a year has been the rule. The vessels built up to and including the 1928 programme, that is, the "Odin," "Parthian," and "Rainbow" classes, were of a general service type of 1,475 tons, 17½ knots, and an armament of one 4-in. and two smaller guns and eight torpedo tubes.

Under the 1929 programme a departure was made, and a "Fleet submarine," H.M.S. Thames, was built by Vickers-Armstrongs, Ltd. The Thames was launched on January 26, 1932, at Barrow, and named by Mrs. Backhouse, wife of the Third Sea Lord. Her standard displacement is 1,805 tons, or over 300 tons more than the previous classes, and the armament includes a 4·7-in. gun and six tubes. The length is 325 ft., as against 271 ft.; but the breadth, 28 ft., is, on the contrary, less than that of earlier submarines, in which the breadth is 29 ft. 10 in. The draught of water of the Thames is 13 ft. 6 in., or 4 in. less than in the earlier class. The Thames, therefore, is a much longer but narrower craft.

The other two submarines of the 1929 programme, the Swordfish and Sturgeon, inaugurated a new class of smaller vessels. Their surface displacement is 640 tons, and the armament includes a 3-in. gun. The Swordfish was launched by Lady Tyrwhitt, wife of the Commander-in-Chief at the Nore, on November 10, 1931; and the Sturgeon by Mrs. Little, wife of the Rear-Admiral of Submarines, on January 8, 1932.

The three submarines authorised in 1930 are likewise divided into two types. The Starfish and Seahorse, laid down in September, 1931, at Chatham Dockyard, are of similar design to the Swordfish and Sturgeon. They are being both built and engined at Chatham. The other vessel, H.M.S. Porpoise, is of a type more nearly corresponding to the "Rainbow" class, but somewhat heavier, and with a 4·7-in. instead of a 4-in. gun. The Porpoise was laid down by Vickers-Armstrongs, Ltd., at Barrow on September 22, 1931, and launched there by Lady Fuller, wife of the Second Sea Lord, on August 30 1932. She is of 1,500 tons, 267 ft. long, 29 ft. 10 in. broad, and with a draught of 13 ft. 9 in.

The 1931 programme was a replica of that for 1929. It provided for two more submarines of the "Swordfish" class, one to be called H.M.S. Shark, and to be built at Chatham; and the other H.M.S. Sea Lion, to be built by Cammell Laird and Co., Ltd.

The third vessel of the programme will be of the "Thames" class, and will be known as the Severn. The contract for this vessel was awarded to Vickers-Armstrongs, Ltd., on November 20, 1932.

## NEW SLOOPs.

Provision has now been made for 22 sloops under the post-war replacement programmes, two in 1927 and for each year since. H.M.S. Rochester, which commissioned at Chatham on March 24, 1932, to relieve the Cyclamen on the Africa Station, completed the four ships of the "Shoreham" type of the 1929 programme. These four sloops attained on trial an average speed of 16.6 knots with about 2,000 s.h.p. Their fuel consumption is about 1.15 lbs. per s.h.p. hour. The four of 1930 were all dockyard-built, and took the water in 1932. The Falmouth was launched by Lady Astor at Devonport on April 19; the Milford by Mrs. Reinold, wife of the Admiral-Superintendent, Devonport, on June 11; the Weston-super-Mare by Lady Addison, wife of the Director of Dockyards, also at Devonport, on July 23; and the Dundee at Chatham, by Mrs. Round-Turner, wife of the Admiral-Superintendent, on September 20. The Falmouth was commissioned on October 25 for service on the China Station in place of the wrecked Petersfield. The Milford was ordered to replace the Verbena on the Africa Station; the Weston-super-Mare [now renamed Weston] to replace the Delphinium, also on this station; and the Dundee to replace the Heliotrope on the America and West Indies Station.

Orders for the four sloops of the 1931 programme were not placed until September, 1932. Two are being built at Devonport, the Grimsby and Leith. The other two, by contract, will be mine-sweeper sloops, and have been given names of the old torpedo gunboats, the Skipjack and Halcyon. Messrs. John Brown and Co., Ltd., will provide both their hulls and machinery.

## NEW NETLAYER.

The first vessel of the Royal Navy to be built specially as a net-layer and target-towing ship is H.M.S. Guardian, authorised under the 1930 programme, and laid down in October, 1931, was launched at Chatham Dockyard on September 1, 1932, the Mayoress of Chatham performing the naming ceremony. The design of the Guardian is one of the first for which Mr. A. W. Johns, C.B., C.B.E., has been responsible as Director of Naval Construction. She is of 3,050 tons, 310 ft. long, 58 ft. broad, and with a draught of 12½ ft. With geared turbine engines of 6,500 horse-power, provided by the Wallsend Slipway and Engineering Company, and oil-fired boilers, the designed speed is 18 knots. There is capacity for 720 tons of oil fuel. The armament includes two 4-in. A.A. guns.

## GUNBOATS AND AUXILIARIES.

Following the completion of the Falcon by Yarrow and Co. in 1931, the Navy Estimates of that year provided for another river gunboat. The order for this was placed in April, 1932, with Messrs. Thornycroft and Co., Ltd., and the ship will be called the Sandpiper.

The Sandpiper will be 160 ft. long between perpendiculars, with

a beam of 30 ft. and draught of 2 ft. The standard displacement will be 185 tons. Twin-screw reciprocating machinery of 600 H.P. will give a speed of  $11\frac{1}{4}$  knots. The armament will consist of one 8·7-in. howitzer, and one 6-pounder.

Another tender for the Mining School, similar to H.M.S. Nightingale, floated out on September 30, 1931, is the Skylark, floated out on November 15, 1932, at Portsmouth. These vessels are of a length of 100 ft., and a breadth of  $24\frac{1}{2}$  ft. Whereas the Nightingale has a draught of 7 ft. 1 in., and a displacement of 275 tons, the Skylark has a draught of 7 ft., and a displacement of 270 tons. In both ships, the machinery is of 400 H.P., with a corresponding speed of 10 knots.

Two boom defence vessels have also been provided for. The Moorgate, built by Messrs. Bow, McLachlan and Co., Paisley, is of 325 tons, with a length of 93 ft., breadth of 25 ft., and mean draught of 8 ft. 10 in. The Bishopsgate is to be of 290 tons, with a length of 93 ft., breadth of 26 ft., and a mean draught of 7 ft. 10 in. Each vessel carries one 4-in. gun.

#### SHIPS SCRAPPED.

The capital ships scrapped by Great Britain under the London Treaty were five in number, in the following order: Benbow, Emperor of India, Marlborough, Tiger, and Iron Duke. The sale of the Benbow was completed in February, 1931. The Emperor of India was utilised in the spring of that year for firing tests off Bognor Regis, and subsequently salvaged and taken to Portsmouth; she left there on February 6, 1932, for Rosyth to be broken up. The Marlborough was utilised for experiments with explosives during 1931. She was afterwards prepared for sale at Portsmouth and disposed of in May, 1932. The battle-cruiser Tiger had already been disposed of.

The provisions of the Treaty were thus carried out in advance, as the first two ships were required to be "rendered unfit for warlike service" by December 12, 1931, and "finally scrapped" by December 31, 1932. The second two ships were required to be similarly dealt with by June 30, 1932, and June 30, 1933, respectively. Actually they were disposed of a year in advance of the schedule.

The Iron Duke, the fifth ship for scrapping, was allowed to be retained for training purposes. She was paid off into dockyard control at Devonport on November 10, 1931, to be "demilitarised." The treatment required under the pact was as follows:—

- (1) Removal of main armament guns, revolving parts of all barbettes and turrets; machinery for operating turrets; but three turrets with their armament may be retained in each ship;
- (2) removal of all ammunition and explosives in excess of the quantity required for target practice training for the guns remaining on board;
- (3) removal of conning tower and the side armour belt between the foremost and aftermost barbettes;
- (4) removal or mutilation of all torpedo tubes;
- (5) removal or mutilation on board of all boilers in excess of the number required for a maximum speed of eighteen knots.

The Iron Duke commissioned at Devonport on September 6, 1932, for trials after her reconstruction.

## FLEET DISTRIBUTION.

Apart from changes due to normal routine and service, there was only one important alteration in the distribution of the British Fleet during 1932. This was announced by the First Lord when introducing the Navy Estimates in the House of Commons on March 7. Mainly in the interests of economy, but partly also to lessen the number of changes among officers and men during the period of a ship's commission, the Board decided to reduce the strength of the Mediterranean Fleet. The number of battleships was altered from six to five, the ship reduced, H.M.S. Ramillies, being transferred to home waters. The change took effect when the Ramillies returned home in June, 1932, to pay off for large repair.

In the original post-War distribution, six battleships were allotted to the Mediterranean, of which two were later maintained with three-fifths' complements at Malta. In 1924, the battle force on this station was increased to eight ships (four "Queen Elizabeths" and four "Iron Dukes"). In 1926, the four "Iron Dukes," which formed the Third Battle Squadron, were brought home to be used as a boys' training squadron, and in their place two "Royal Sovereigns" were allotted to the Mediterranean, making a total of six battleships, which has been the nominal strength ever since.

It was also decided in March, 1932, that only one aircraft carrier, the Glorious, should be attached to the Mediterranean Fleet. Consequently, the Eagle, which had been paid off in August, 1931, for large repair, was ordered not to rejoin that Fleet unless required as a temporary relief for the Glorious. This decision meant that of the six carriers on the effective list, four would be in home waters, the Courageous (flagship of the Rear-Admiral) and the Furious in the Home Fleet, and the Eagle and Argus in reserve. The Glorious and the Hermes were in the Mediterranean and China respectively. In September, it was decided that the Eagle was to commission in April, 1933, and leave about the end of that month for China, to replace the Hermes.

The number of destroyer flotillas in the Mediterranean was reduced from four to three, the change taking effect when the Second Flotilla returned home in March, 1932. After being reconstituted to include the four new destroyers of the Crusader class, the Flotilla joined the Home Fleet. Each of the two main fleets now has three flotillas of destroyers. The three in the Mediterranean are manned with full peace complements. Three in the Home Fleet (except in the case of new ships in their first commission) will be provided for in mobilisation requirements as formerly, but they actually carry only about four-fifths of their complements, with, however, 100 per cent. of engine-room ratings.

## THE HOME FLEET.

When the Atlantic Fleet passed Ushant on returning from its spring cruise on March 12, 1932, its title was changed to that of Home Fleet, thus reverting to pre-war practice. In the original post-war

distribution, provision was made for both an Atlantic Fleet under Admiral Sir Charles Madden, and a Home Fleet under Vice-Admiral Sir Henry Oliver, but this arrangement only lasted from April to November, 1919, when Sir Henry Oliver became Vice-Admiral Commanding Ships in Reserve. The title of Home Fleet had since been in abeyance.

Of the ten capital ships which remained available for home waters after providing five for the Mediterranean, it was decided in March, 1932, that three, inclusive of any that are in hand for large repair, will be treated as being in reserve. The other seven will carry in peace time crews of about four-fifths of their full war complements, with some adjustment upwards in engine-room complements. For the three ships in reserve, provision is made under Vote A for only 70 per cent. active service crews, but 100 per cent. of higher non-substantive ratings, as a mobilisation requirement. For the seven in commission, full active service crews will continue to be provided under Vote A as a mobilisation requirement.

#### Cruiser Changes.

The year was also marked by the return of a heavy cruiser to the squadron on the America and West Indies Station. H.M.S. Norfolk, withdrawn from the Second Cruiser Squadron, Home Fleet, was recommissioned at Devonport on September 6 and at the end of October relieved the Delhi as flagship at Bermuda. For ten years, since the stranding of the Raleigh off the Labrador coast on August 8, 1922, the British Navy had been represented on this important station by the small 6-in. gun cruisers of the "C" and "D" types. The Delhi, on relief, proceeded to the Mediterranean to relieve the Curacoa as flagship of the Third Cruiser Squadron. The Curacoa reverted to private ship status, and the Colombo was recalled and paid off into reserve.

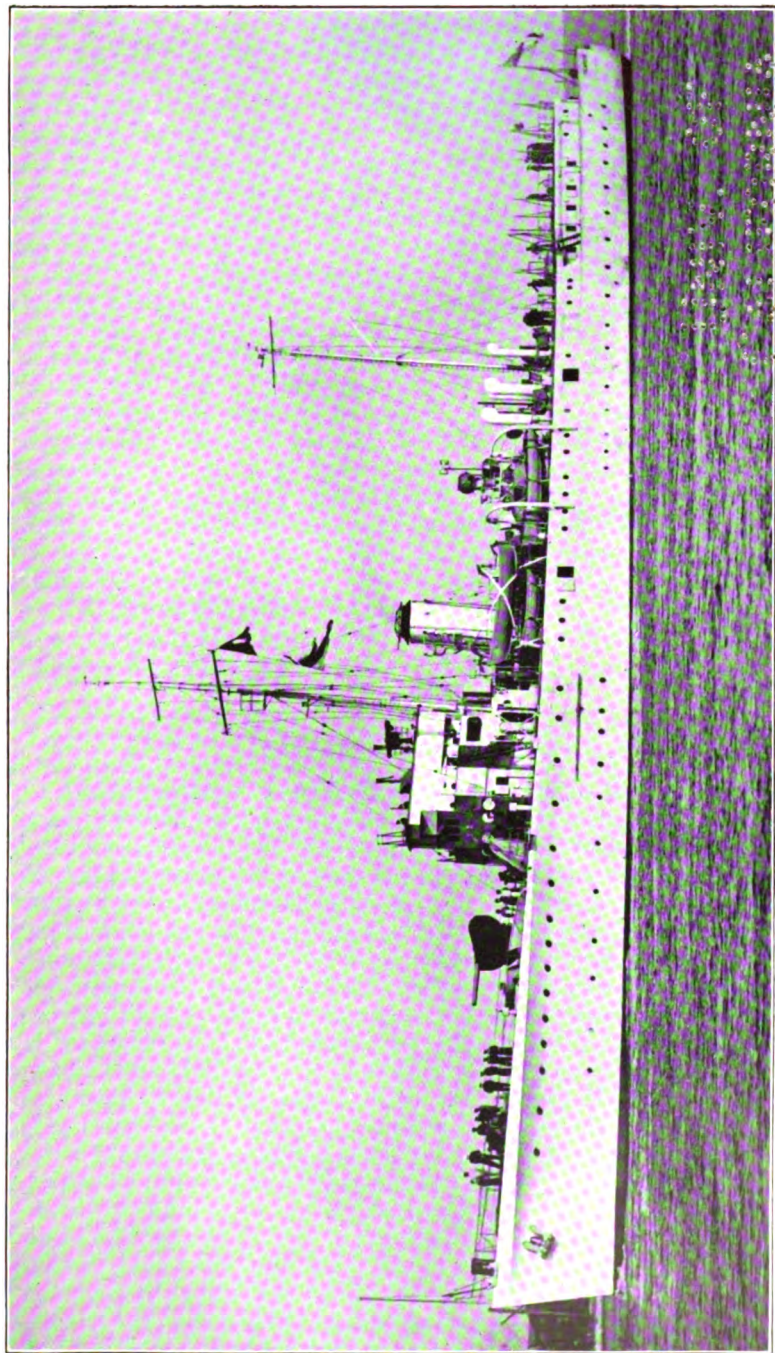
It is indicative of the scarcity of cruisers that ships like the Curacoa, Ceres, and Curlew, laid down in 1916, or seventeen years ago, should still have to be maintained in one of the principal fleets. Had the 1925 schedule of replacement building been adhered to, all the small "C" class ships could by now have been relieved.

After being in company with the Emerald and Enterprise in the East Indies since 1926, the Effingham was withdrawn in September, 1932, and her sister-ship the Hawkins, from the reserve at Portsmouth, became flagship in her place. The Emerald and Enterprise will shortly become due for large repairs, but only a "C" class cruiser, about half as large, will be available to relieve them temporarily.

#### Torpedo and Small Craft.

Early in 1933 the Duncan and the eight destroyers of the Defender class should be available for service, and this will enable the Admiralty to reconstitute the First Flotilla, Mediterranean Fleet, hitherto composed of War-built craft. All three of the Mediterranean Flotillas will then be provided with post-War vessels. In the Home





(Photo by Abrahams and Sons, Devonport.)

H.M. SLOOP FALMOUTH, 1,105 TONS.  
*Commissioned at Devonport for service in China, October 25, 1882.*



Fleet, there is so far only a half-flotilla of new craft. The Amazon and Ambuscade, the first two post-war destroyers, completed in 1927, were in the spring of 1932 allocated to form the destroyer division in Irish waters, based on Queenstown and Berehaven. They replaced the Tenedos and Sturdy, which reverted to the Reserve Fleet.

The four sloops built under the 1930 programme were allocated, like their predecessors, for service on foreign stations. The Falmouth, which was completed at Devonport at the end of October, 1932, went to China to replace the lost Petersfield as despatch vessel. The Milford, due for completion in December, was allocated to the Africa Station in place of the Verbena; the Weston-super-Mare, the third of the programme to be built at Devonport, was ordered to the Africa Station to relieve the Delphinium, leaving England in March, 1933; and the Dundee, at Chatham, was to go to the America Station to replace the Heliotrope. After these changes are effected there will still be several sloops of War design, completed sixteen years ago, on service abroad, such as the Bryony, in the Mediterranean; the Daffodil, in Africa; the Cornflower, in China; and the Laburnum and Veronica, in New Zealand.

Departing from the custom of earlier years, the submarines completed in 1932 were not sent abroad. The Thames was allocated to the Fifth Submarine Flotilla at Portsmouth, and the Swordfish and Sturgeon to the Sixth Submarine Flotilla at Portland, where they relieved War-built vessels of the "H" class.

#### ARMED GUARDS IN CHINA.

The question of the liability of shipowners to pay for guards against pirates provided by the Crown in ships trading in Far Eastern waters was the subject of a judgment on April 11, 1932, in the Court of Appeal, which dismissed an appeal by the China Navigation Company, Ltd., from the decision of Mr. Justice Rowlatt in an action which they brought against the Attorney-General. The Company complained that they had been compelled to pay the whole of the expenses of the guards. They contended that this expense had been covered by the House of Commons votes, to which they contributed as taxpayers, and the Crown was not entitled to require, or accept, payment for the service. Lord Justice Scrutton, in giving judgment, said that he entirely agreed with the view of Mr. Justice Rowlatt that there was no legal duty on the Crown to afford by its military forces protection in foreign parts to British subjects. Had the Crown a duty to follow and protect the missionary and send armed forces to rescue him from his self-imposed danger? The appeal failed because there was no duty enforceable by the Courts on the Crown to render the services for which the appellants asked. There was no compulsion on the appellants to make the payment of which they complained, but if they wanted the services they must pay for them if the King required them so to pay.

## THE ADMIRALTY BOARD.

When Admiral Sir Ernle Chatfield becomes First Sea Lord in February, a complete change among the naval members of the Admiralty Board will have been effected within twelve months. The average age of the new Board is some three years less than that of the old, and this is a good augury for vigour in the handling of the difficult problems which lie ahead. Another advantage is that the new members have had recent sea experience in command, Admiral Chatfield as Commander-in-Chief in the Atlantic and Mediterranean Fleets; Admiral Pound in the Battle Cruiser Squadron, followed by six months at Geneva; Admiral Forbes in command of the Mediterranean Flotillas; Admiral Blake in command of the New Zealand Station; and Admiral Little in charge of the Submarine Service. Some of the principal branches of naval activity are thus represented.

The year 1932 has been one of stock-taking in the Navy. Three Admiralty Committees were appointed in October, 1931, with terms of reference which amounted, to use the words of the First Lord, Sir Bolton Eyres-Monsell, "to a complete review of existing naval policy in regard to the distribution, organisation, manning, training, and discipline of the Fleet." This review was undertaken with the objects, on the one hand, of finding ways of effecting the large reductions in naval expenditure demanded by the national financial situation, with as little interference as possible with new construction and other essential services; and on the other hand of introducing such reforms as experience showed to be necessary. The final report of one committee and progress reports of the other two were reviewed before the introduction of the Navy Estimates, and the First Lord summarised the main conclusions reached in his speech on March 7, 1932. Since then the committees have submitted a number of detailed proposals which have been the subject of investigation.

## ADMINISTRATION.

As from May 1, 1932, the Department of the Accountant-General of the Navy ceased to exist as a separate Department. This post had been in existence for just a hundred years. Its abolition coincided with the retirement of Sir Conrad Naef, C.B., C.B.E., as Accountant-General, and Mr. Frank Storr as Deputy Accountant-General. The Department was merged into that of the Secretary of the Admiralty. A new post of Director of Navy Accounts, to which Mr. F. Porter, O.B.E., formerly Assistant Accountant-General, was appointed, was created. This officer will exercise the functions in regard to cash transactions (whether receipt or payment) affecting naval funds which had formerly been exercised by the A.G. It was hoped that the merging of the two departments would result, said the First Lord on May 25, in a considerable simplification of work and consequent reduction of staff.

On the retirement on March 31, 1932, of Mr. J. Falkner Phillips,

M.B.E., after twenty-four years' service in the Admiralty Library and forty years in the Civil Service, Mr. D. Bonner Smith, Deputy Librarian, succeeded him as Librarian. Mr. H. W. Brookling, M.C., senior clerical officer at the Imperial Defence College, was appointed Deputy Librarian.

The most important change of the year in the realm of administration was the organisation of a new Directorate of Personal Services at the Admiralty. In this respect the Navy was brought more into line with the Army and Royal Air Force. The change was made "in the interests of good administration and with the special object of strengthening the naval element in the consideration which is brought to bear at the Admiralty on questions which affect naval personnel." Formerly, the Manning Department had been concerned chiefly with complements and numbers required on mobilisation, and welfare work was but a part of that allotted to the Naval Personnel Committee, which had been set up after the Armistice, and which was merged in 1928 into the Department of Physical Training and Sports.

By a Fleet Order dated August 5, 1932, it was decided to abolish the post of Director of Manning and to substitute for it that of Director of Personal Services. The officer holding this post has charge both of the Manning Department and also of the welfare work formerly discharged by the Naval Personnel Committee. He is the Naval Adviser of the Board on all questions particularly affecting the lower deck. The Directorate of Personal Services is sub-divided into a Manning and a Personnel Division, each under a Deputy Director. Rear-Admiral A. L. Snagge, formerly Director of Manning, became the first Director of Personal Services, from September 15, 1932. Captain G. W. Taylor, R.N., formerly Assistant Director of Manning, was appointed Deputy Director of Personal Services (Manning); and Captain W. J. Whitworth, D.S.O., R.N., formerly Director of Physical Training and Sports and Head of the Naval Personnel Committee, became Deputy Director of Personal Services (Personnel). Captain Whitworth ceased to be responsible for the work of the Physical Training and Sports Branch, and the Captain of the School of Physical and Recreational Training at Portsmouth is now regarded as Director of the Branch.

The movement towards these changes was manifest to any one who had kept in close touch with the course of events in the Navy since the War. The new organisation took shape exactly a year after the unhappy events at Invergordon, and cannot be dissociated from them. It should strengthen and bring up to date that part of the administrative machinery concerned with the bulk of the personnel, for which ultimately the Second Sea Lord, as Chief of Naval Personnel, continues to be responsible. A very suitable appointment made to the staff of the new Directorate was that of Commander Alfred O'Leary, R.N., one of the few officers of this rank who had gained promotion from the lower deck via the grade of mate.



## THE FLAG LIST.

A reduction in the active list of rear-admirals from forty-eight to thirty-nine within a year was noted in the last issue of the "Annual." As a result of the fewer vacancies for promotion thus caused, during 1932 there was an appreciable increase to be observed in the seniority of captains at the top of their list. On June 30, 1932, there were seven captains who had served for twelve and a half years in this rank, and thirteen more who had served for twelve years. The indications were that some captains might have to serve for thirteen years before reaching their turn for advancement or for retirement as rear-admirals. The last time captains had to serve so long was in 1903. Following the recommendations of the Goschen Committee of that year, the flow of promotion to flag rank was stimulated and the period was brought down even below ten years. The pendulum has since swung back again.

Large retirement lists, however, were announced by the Admiralty in the Press on July 1 and October 12. In the former, five captains were promoted to rear-admiral, of whom three were retired on promotion. In the latter, fourteen captains were promoted to rear-admiral, of whom twelve were retired on promotion. The seniority of the captain remaining at the top of the list was thus brought down to eleven years ten months.

The mere cutting down of numbers on the Flag List, without corresponding measures for preserving the flow of promotion, hardly serves a useful purpose, for the more the number of rear-admirals are reduced, the greater the stagnation at the top of the captains' list. This is reflected not only in the increased length of time which captains have to serve in the rank, but also in an actual increase of numbers, for in spite of the fact that many are retired on reaching their turn for advancement to flag rank the number passing off has not balanced the ten promoted to captain each half-year. The following figures are taken from the official Navy Lists :—

July, 1930.	Total captains	225
January, 1931.	" "	231
July, 1931.	" "	227
January, 1932.	" "	230
July, 1932.	" "	236

## FLAG OFFICERS' EMPLOYMENT.

When introducing the Navy Estimates on March 7, 1932, the First Lord said that conditions since the War had brought about a decreased flow of promotion, with the result that the ages of officers in each rank had been steadily increasing. The situation had now become so acute that if it were not at once dealt with, it might soon be necessary to stop all promotion from lieutenant-commander to commander for a year. In order to prevent such a serious contingency, it had been decided, he said, to curtail employment at the top of the officers' list to the extent necessary to ensure an adequate number of vacancies in the interest of officers generally.

An indication of the application of this rule was given in selecting

a successor to Admiral the Hon. Sir Hubert Brand as Commander-in-Chief at Plymouth. The choice fell upon Vice-Admiral Eric J. A. Fullerton, who was fifty-four on taking up the command, and who at the time of his selection stood seventeenth on the list of twenty vice-admirals. Over a score of officers may be said to have been passed over in order to make this appointment. Formerly it had been the usual practice of the Navy to regard seniority coupled with service qualifications as constituting a prior claim to employment. Under the conditions obtaining in recent years, this custom has its disadvantages. If most of the employment is held by officers at the top of the lists, this tends to raise the average age, and also to restrict the chances of promotion and service for the younger officers. As a writer in *The Times* pointed out :—

Only two factors operate to remove officers from the list : age and non-service. The former has little influence, since it is rare that an officer continues to serve until reaching the age limit of his rank. More often an officer is retired for non-service, or he retires voluntarily before being overtaken by the non-service rule. In a time of great Fleet reduction this practice, if continued, will fall more heavily on the junior officers than the senior. It is to obviate this that the Board have adopted the policy referred to by the First Lord.

#### PROMOTION AND PROSPECTS.

There has been some discussion during the past year as to the restricted opportunities in the post-war Navy for young officers to gain experience and exercise responsibility. One correspondent in a Service journal instituted a comparison of the number of officers in certain ships in 1922 and 1932. A battleship with five lieutenant-commanders and nine lieutenants in 1922 carried in 1932 seven lieutenant-commanders and eight lieutenants. In another ship the numbers were two and eleven, and they had varied to five and six. A third instance showed an even greater variation, from three lieutenant-commanders and eleven lieutenants to eight and four respectively. All this indicated that the ships' officers as a whole were older and more senior, rendering it the more hard for the junior officer to show his capabilities unless there is a special arrangement of duties to give him an opportunity.

This is but another aspect of the promotion problem. The zones of selection have been moved higher up the lists, and are now from four years to eight years for commanders to be promoted to captain, and from three years to seven years for lieutenant-commanders to be promoted to commander. With fewer ships at sea, there is the more competition for appointments, and when officers do at length get to sea they find their way of promotion clogged by older and senior officers of the same rank still serving on because (1) they have not reached the top of the zone, at which most promotions are given, or (2) they have been passed over for promotion and therefore remain on instead of receiving a fresh appointment in a new rank. It is certainly not a good thing that the larger vessels should be crowded with lieutenant-commanders, several of whom must be doing jobs which are really beneath their status. On the other hand, a quick remedy is not easy to find, and the problem may have to be left to

straighten itself out, which it will do in time when the reduced post-War entries reach the corresponding positions on the lists.

For the next three or four years, according to a statement made in the House of Commons on May 4 by Lord Stanley, Parliamentary Secretary to the Admiralty, only about 40 per cent. of the lieutenant-commanders entering on the zone of promotion could expect to be promoted to commander. After that, if no further reductions were made in the personnel, it was expected that about 50 per cent. of those entering the zone would be promoted. During recent years, entries of cadets had been restricted, so that it was hoped that when they entered the zone a substantially higher proportion of them would ultimately reach the rank of commander, probably about 55 per cent.

About 50 per cent. of the officers passing out of the zone of promotion from commander to captain in 1932 reached the latter rank. Since December, 1926, the number of lieutenant-commanders promoted to commander had been increased to fifty a year in two half-yearly batches of twenty-five, and of those officers who were effectively entering the zone of promotion, only about 40 per cent., according to Lord Stanley, would reach the rank of captain so long as existing conditions were maintained.

The following table illustrates the foregoing particulars given by the Parliamentary Secretary :—

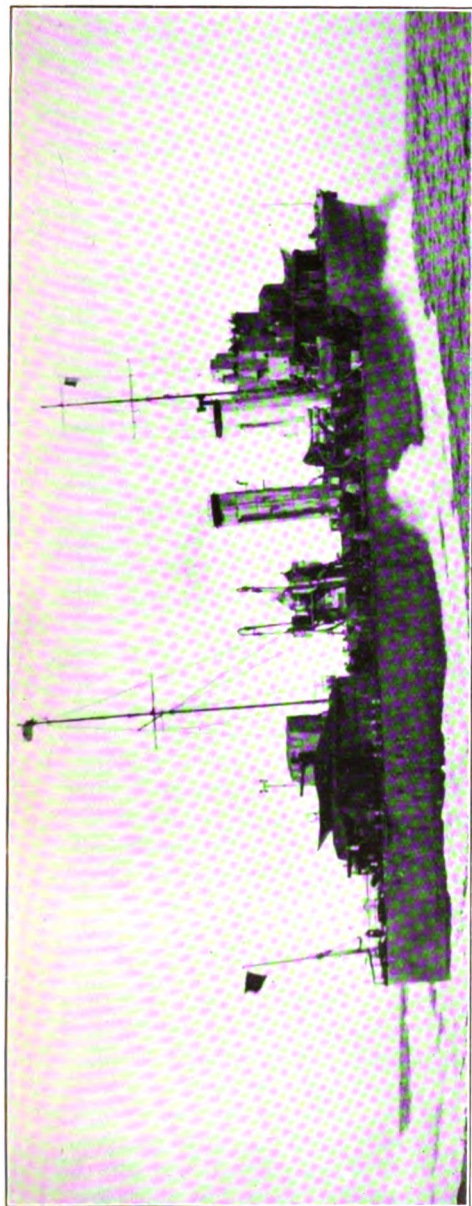
#### NUMBERS OF LIEUTENANT-COMMANDERS.

When Promoted.	Enter Zone.	Total Number Entering Zone.
1928	1931	161
1929	1932	98
1930	1933	113
1931	1934	163
1932	1935	110
1933	1936	110
1934	1937	152
		<hr/>
		907
	Average per year	129

From 1932 onwards it might be expected that there would be a steady decrease in the number of lieutenant-commanders entering the zone, but the table shows that this is not likely. The high total of lieutenant-commanders of 1931 (163) indicates a lack of prevision on the part of the Admiralty at the time of the retrenchment scheme of 1922, when these officers were sub-lieutenants. Had there been more weeding out lower down the list the number coming on to the grade of lieutenant-commander might have been kept down to 100 a year, and the proportion who would have had the chance of going on to the commanders' list would then have been 50 per cent.

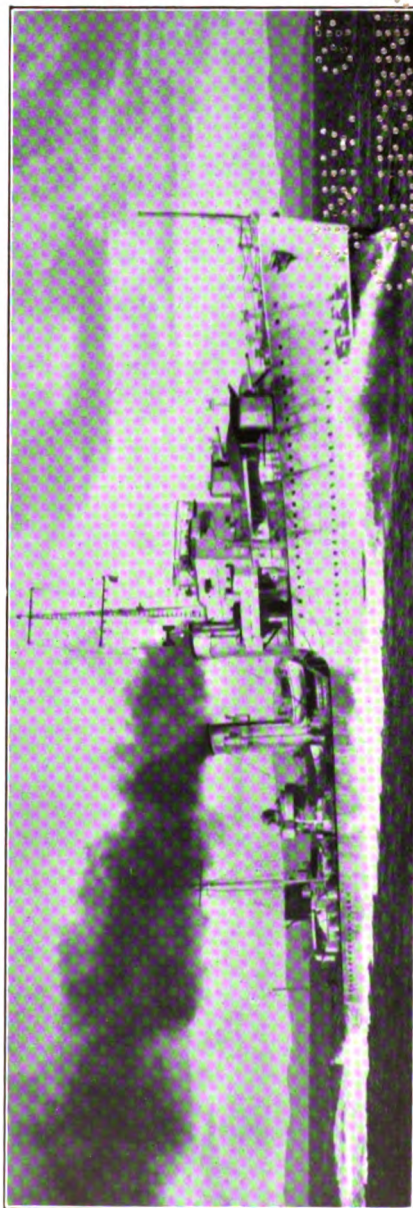
#### DECLINE IN SEA TIME.

The decline in the amount of sea time and thus of experience which has been brought about by the retrenchment of late years was a subject of discussion during 1932. It was advocated by certain authorities that the proportion of personnel in capital ships should



H.M. DESTROYER DARING, 1,375 TONS.

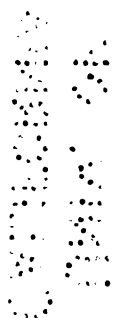
*Completed by J. I. Thornycroft & Co., Ltd., November, 1932.*



H.M. DESTROYER DIAVOND, 1,375 TONS.

*Completed by Vickers-Armstrongs, Ltd., October, 1932.*

*(Photos by courtesy of the builders.)*



be reduced and the officers and men released drafted to sloops and minesweepers, which are comparatively inexpensive to run. On February 24, 1932, in reply to a question in Parliament, Lord Stanley, Parliamentary Secretary to the Admiralty, said that the average amount of sea time already served by captains in that rank when appointed to command H.M. ships during 1931 was one year and 121 days. The corresponding service of captains in 1913 was two years and thirty-seven days.

#### FIRST OSBORNE CAPTAIN.

An interesting feature of the promotion list issued on New Year's Day, 1932, was the advancement for the first time of an ex-Osborne cadet to the rank of captain. This was Captain H. T. C. Walker, son of Lieutenant-General Sir H. B. Walker, and one of the seventy-five cadets who entered Osborne when it was opened in September, 1903. Captain Walker served for the greater part of the War as a lieutenant of the *Bellerophon* in the Grand Fleet, but he was also in the *Vindictive* at Zeebrugge in 1918, where he lost an arm. It may be of interest to recall that 278 applicants were interviewed by a committee in August, 1903, for this first entry, of whom seventy-five were accepted and joined Osborne. Of these, sixty-four passed into Dartmouth two years later, and fifty-six passed out of Dartmouth in August, 1907, all of whom were rated midshipmen from May 15, 1908. During the next six years, eight dropped out from various causes, and there were forty-eight officers of the batch serving on the active list when the War began in August, 1914. In 1932, this total had declined by another twenty officers, and the number on the active list was twenty-eight, or exactly half of the total of cadets who had passed to sea twenty-five years earlier. The twenty-eight still serving were made up as follows: Captain, 1; Commander, 16; Commander (E.), 5; Lieutenant-Commander, 4; Royal Air Force, 2; total, 28. There were no ex-Osborne cadets in the list of promotions to captain dated June 30, 1932.

#### SPECIALISATION AND SERVICE EXPERIENCE.

The question of the duties and service of specialist officers was considered by the Board during the past year. It was felt that all officers should have as much general service experience as possible, and that their duties in connection with specialist work should make due allowance for this. Accordingly, on September 23, 1932, the Admiralty promulgated certain decisions on the matter. While it is not proposed to make hard and fast rules as regards seniority of selection, endeavour will be made to avoid selecting officers required to specialise in G., T., A/S., and P. & R. T. before completing a full commission at sea as Lieutenant, the aim being to select at between two and a half and five years' seniority as Lieutenant. This should enable junior officers to acquire powers of command and leadership at a time when these are most readily assimilated.



The position of navigating officers is different, as the early sea employment of officers of this branch gives ample opportunity for general service experience and should, in the view of the Board, be no handicap to the development of command. No change is therefore to be made in the present method of selection for specialisation in N. Their Lordships drew the attention of senior officers to the fact that general service duties do not interfere with N. duties to any great extent, and that more call should be made on the services of N. officers for such duties. On promotion to Commander, N. officers will be regarded as available for all general service appointments.

The present method of specialisation in signals and W/T is so concerned with the efficiency of material and its use that a period of general service time, states their Lordships, is essential if these specialists are to be adjudged on their ability to command. Arrangements were therefore ordered to be made to ensure that all S. and W/T officers considered likely to rise to higher ranks shall be given the period of general service laid down. Normally, this period will commence at the expiration of the S. and W/T appointments officers are holding when they attain seven years' seniority as Lieutenant. In view of the foregoing, selection for specialisation in S. and W/T will be rather earlier than in the case of G., etc., though the general principle of one complete commission at sea as Lieutenant before selection will be adhered to as far as possible.

As regards submarines, the Board's view is that service in these craft differs from normal specialist service in that it gives sufficient opportunity for the development of command and leadership. Intervals of general service are necessary only in order to keep the officer in touch with the conditions in surface-going vessels. The serious defect of the present system of selection is the large number of officers required for the first period in submarines compared with that required for the second period. There is much difficulty in finding so large a proportion for the first period, and in order to reduce requirements to those actually needed for service in submarines, and at the same time to correct an erroneous impression which has arisen concerning the capabilities of officers returning to general service after the first period, their Lordships made the following decisions: (1) The first period in submarines shall be extended to four years (instead of three years) and shall be regarded as formerly; (2) officers who wish to serve in submarines are to be given preference for the first period appointments, but volunteers for further service in submarines will not be called for until about six months before the end of the first period.

Officers for advanced specialist courses will be selected according to their aptitude for the duties which will eventually be required of them, not necessarily according to the results of the ordinary specialist examination. It is anticipated that the numbers so selected will be more limited than in the past.

## LOWER DECK PROMOTION.

The first promotions from the rating of A.B. to the rank of acting sub-lieutenant under the revised scheme of lower deck advancement recommended by Vice-Admiral Larken's Committee were made on December 1, 1931, and numbered twelve. A further batch of eight seaman ratings was promoted with effect from December 1, 1932. The title of mate was removed from the Navy List of November, 1931, in which those who had formerly held this rank were shown according to their seniority in the list of sub-lieutenants. Of the twelve able seamen promoted on December 1, 1931, half came from ships and establishments at home, and half from the Mediterranean Fleet.

An Order in Council published in the *London Gazette* on December 22, 1931, granted discretionary power to the Admiralty to make not more than one promotion to the rank of lieutenant (E) from the ranks of commissioned mechanician and warrant mechanician, so long as the number of officers holding these ranks remains insufficient to admit of such a promotion under the ordinary regulations, which limit such promotions to 8 per cent. of the total number of officers. At the time of the new order the total of commissioned and warrant mechanicians was only ten, which was insufficient to allow of a promotion. As a sequel to the new order, Commissioned Mechanician John George Hicks, D.S.M., was promoted to Lieutenant (E) from December 17, 1931.

## NEW PAYMASTER RANKS.

The creation of the new Naval Cook Branch by Order in Council of May 22, 1931, was recorded in the last "Annual." Through the warrant grades, ratings in this branch may rise to the ranks of paymaster lieutenant (C) and paymaster lieutenant-commander (C). Apart from the ordinary paymaster lieutenants, there are now three other groups of officers in this rank—paymaster lieutenants (C), promoted from the list of commissioned cooks; paymaster lieutenants (S), promoted from the list of commissioned supply officers; and paymaster lieutenants (W), promoted from the list of commissioned writers. Replying to a question in Parliament on September 30, 1931, Sir Austen Chamberlain, then First Lord, said that these three groups of officers were not interchangeable, and differed from ex-cadet officers in the scope of the duties they were qualified to perform, the emoluments to which they were entitled, and the regulations for their advancement and retirement. It had therefore been found desirable to distinguish them by an appropriate title. The only other alternative would be to have an entirely separate list. He thought it was better that they should appear with those distinctive marks in the Navy List than that separate lists should be kept for them.

## CHANGES IN MESSING.

A Committee under the presidency of Mr. G. F. Cotton, M.V.O., O.B.E., Director of Victualling, was set up in October, 1931, to

consider representations made concerning the cost of messing in ships victualled on the standard ration and messing allowance system. Paymaster Captain A. F. Strickland, O.B.E., and Paymaster Commander C. A. Shove, O.B.E., were among the members. Decisions of the Admiralty on the Committee's conclusions were promulgated in Fleet orders dated October 14, 1932. The standard ration system is to be continued in certain classes of vessels, and in the Training Squadron for Boys (if instituted). Arrangements were approved whereby the younger ratings might be better prepared to cope with the conditions of life in a standard ration ship. In small cruisers, where the numbers in certain broadside messes are very small, the setting up of such messes is to be reduced to a minimum, as being very uneconomical.

#### SPECIAL RETIREMENT SCHEME.

On August 5, 1932, the Admiralty extended the special retirement scheme for lieutenant-commanders and lieutenants to a number of officers whose seniority was just outside the zones of seniority for this scheme. Their Lordships approved that the restriction of the scheme to lieutenant-commanders of the years 1931 to 1925 and the second half of 1924 should be removed, and applications to retire were again invited from lieutenant-commanders of the years 1923 and the first half of 1924, lieutenant-commanders of seniority 1932, and lieutenants of seniorities 1924 to 1926. This brought within the scope of the scheme about 400 more officers. At the one end were about eighty who had entered Osborne as cadets between May, 1904, and September, 1907. At the other were over 300 officers who had entered Osborne in 1914-18, or by special entry from the public schools during 1919, or had been commissioned from the lower deck during the War or entered from the mercantile training schools or the R.N.R.

#### STABILISATION OF PAY.

A welcome change was announced on August 5, 1932, on the subject of officers' emoluments. The frequently-urged stabilisation of the rates of pay was then accepted in principle, and the prospect of the removal of the irritating reductions ascribed to falls in the cost of living came as a boon to all concerned. It was notified that the Government had had the whole question of the remuneration of the Services of the Crown under review, and had decided that emoluments should cease to vary automatically with changes in the index figure, but should be consolidated. They further decided that, subject always to the overriding consideration of the national financial position, final consolidation should be deferred until April 1, 1934, and that in the meantime the rates should be stabilised at the current reduction from standard rates, viz., 11 per cent., which corresponds to a cost of living figure of about forty-nine. This decision is subject to the following provision: If during the above period of stabilisation, the index figure is either below thirty-five or

above sixty for six consecutive months, the resultant situation will be reviewed in the light of all relevant considerations including the cost of living.

Many naval officers serving overseas have been affected adversely by the British departure from the gold standard. Up to February, 1932, such officers received their pay and allowances in sterling, with the result that those in "gold standard" countries suffered a marked decrease in purchasing power as a result of the British departure from the gold standard. A temporary concession has been made to the personnel on certain stations adversely affected, notably the Cape of Good Hope.

#### SERVICE CONDITIONS.

The "Welfare Conferences" which were started in 1919 were done away with by a Fleet Order dated September 23, 1932, and in their place there is to be set up an "Admiralty Review of Service Conditions." It is contemplated that the first of these reviews will be ordered about the end of 1935. This will be three years after the last of the Welfare Conferences, which was held in 1932 at Devonport. A list of twenty-nine general requests formulated at this Conference was published in A.F.O. 1678, dated 15, 1932. Several of the requests were concerned with the future of the men after leaving the active service, such as pension conditions, vocational training, and the like. A scheme of contributory insurance for the Navy was advocated, to provide an augmentation of the existing long-service pension and other benefits which might be possible.

To be entirely satisfactory, in their Lordships' opinion, the new system of Reviews must be based upon a direct and sympathetic association between officers and men, must be representative of all sea-going fleets and squadrons, as well as shore establishments, and must be expeditious. When ordered, such Reviews will accordingly be conducted on the following lines, the procedure being modified as necessary to meet the requirements of flotillas and shore establishments :—

(a) In every ship the men are to be informed that they may put forward to their divisional officer representations affecting their Service conditions.

(b) The Captain to consider all representations so presented, assisted by the executive officer and the heads of departments, at a meeting at which each divisional officer is to be heard in regard to the representations put forward by the ratings of his division, the Captain calling such evidence as he considers necessary. The Captain then to forward all representations to the Commander-in-Chief through the usual channels, together with his remarks.

(c) The Commander-in-Chief to appoint a Fleet Committee, consisting of senior officers, to consider the collated representations from the whole Fleet, calling such evidence as they consider necessary. All representations to be forwarded subsequently to the Admiralty by the Commander-in-Chief, together with his remarks.

The following subjects are to be regarded as outside the scope of these reviews :—Matters of policy, such as the employment or distribution or training of the Fleet ; matters of discipline, or the general arrangements of duties in the Service ; canteen arrangements ; complements of ships and establishments ; and individual claims or complaints of any kind, or matters affecting individual ships or establishments. (These will be dealt with under the revised Articles 9 and 10, King's Regulations and Admiralty Instructions.)

## REDRESS OF WRONGS.

Concurrently with the foregoing changes, the Admiralty altered the regulations concerning the redress of wrongs. In their Lordships' opinion, the existing regulations on this subject were adequate for the purpose, but they decided to supplement them by a further article making provision on a wider basis for representations affecting welfare generally, in making which the divisional organisation is to be utilised. The former article 9, King's Regulations and Admiralty Instructions, was reprinted as article 10, and in a new article 9 there appeared the procedure for making representations, with emphasis on the part that divisional officers and divisional petty officers should take, and the duty that rests on all petty officers, non-commissioned officers, and leading ratings in such matters.

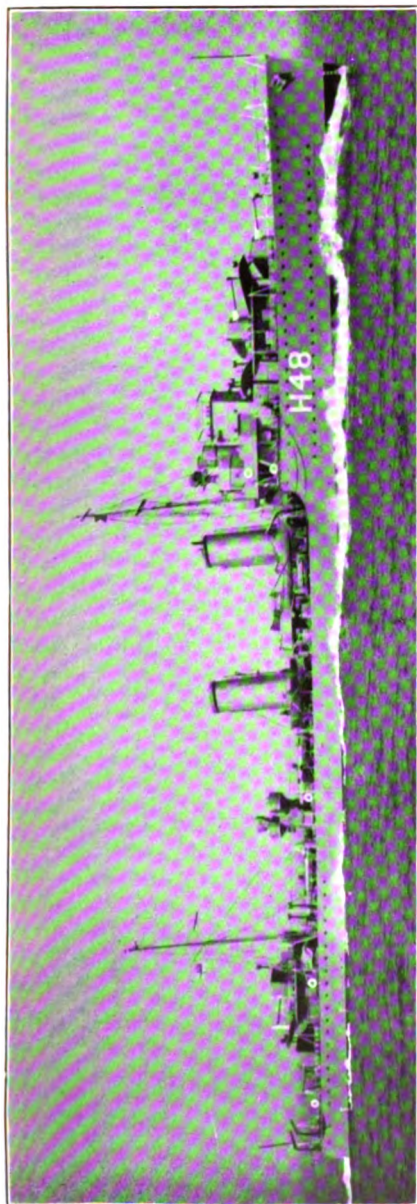
## SHORT SERVICE SCHEME REVIVED.

After being closed since September, 1929, the entry of seamen under the special service scheme was resumed on October 1, 1932, with entries of twelve ordinary seamen per week, four at each port. The numbers to be entered will be regulated from time to time according to requirements. Special service seamen are required to sign for twelve years, of which the first seven years are in the Fleet and the remainder in the Royal Fleet Reserve. Ordinary seamen (S.S.) receive six months' training at the Royal Naval Depots. They may rise to leading seamen, and so far as the length of their service permits, are eligible to obtain non-substantive ratings under the same regulations as continuous service men.

In the *London Gazette* on August 12, 1932, authority was given to extend the special service system to the telegraphist branch, and to enter men as ordinary telegraphists, rising to telegraphist and leading telegraphist, at the following rates of pay: Ordinary telegraphist, S.S., 2s. a day; Telegraphist, 2s. 9d., after three years, 3s. 1d., and after six years, 3s. 5d.; Leading telegraphist, 4s. 4d. The 2s. rate for ordinary telegraphists is the same as for C.S. men, but the other rates are 6d. a day less than for C.S. men.

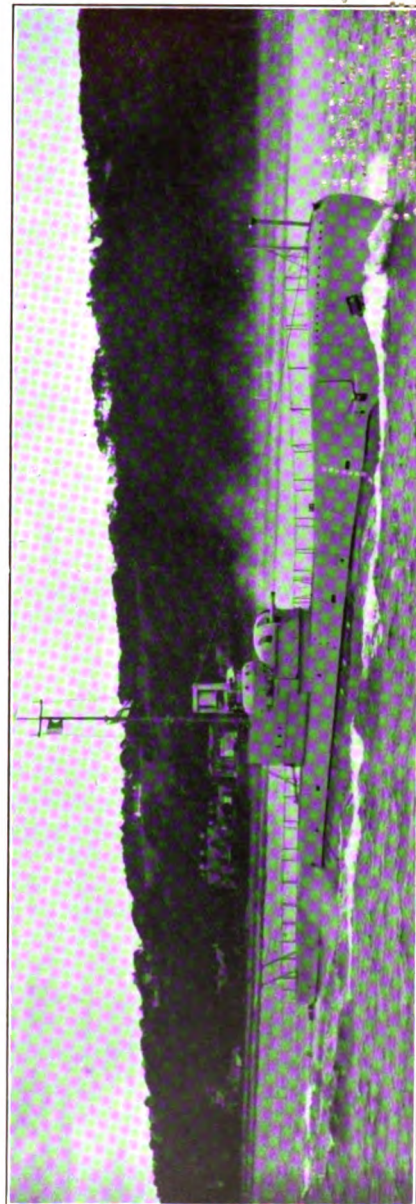
## THE ROYAL MARINES.

The numbers voted for the Royal Marine Corps in 1932 were again under 10,000, as compared with 18,500 in 1914. There was, however, an increase from 550 to 865 in the numbers allowed for the Royal Marine Police, to allow for the further substitution of Metropolitan Police in the Royal Dockyards. The new R.M. Police were introduced at Sheerness Dockyard on April 1, 1929. The Admiralty decided that the transfer of police duties at Chatham to the new force should be completed by February 1, 1932, but the question of accommodation cropped up, and in the 1932 Navy Estimates a vote was taken for £13,000 towards a scheme estimated at £29,750 for new quarters for the Marine Police. In his Report on the Navy Appropriation Account for 1930, issued on March 19, 1932, the



H.M. DESTROYER CRESCENT, 1,375 TONS.

*Commissioned at Chatham, April 21, 1932.*



H.M. SUBMARINE THAMES, 1,760 TONS.

*(Photo by courtesy of the builders, Vickers-Armstrongs, Ltd.)  
Commissioned at Barrow, June 19, 1932.*



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Comptroller and Auditor General says that the resultant saving in pay and allowances at Chatham was originally estimated to be over £14,000 per annum, in addition to a considerable future saving on pensions. It has, however, been found necessary, in view of the special circumstances of a large urban dockyard, to increase the numbers of Marine Police to be employed at Chatham as compared with the Metropolitan Police, and the substitution will also entail expenditure on housing.

An Order in Council in March, 1932, provided for the appointment of a Chief Constable, Royal Marine Police, with effect from January 1, 1932. The appointment is non-pensionable, and is to be filled by a lieutenant-colonel or major, Royal Marines, on the retired list. It is to be held during the pleasure of the Admiralty, and to be vacated on the holder reaching the age of sixty. The salary is £1,000 a year, standard rate, and an official residence is provided, or an allowance in lieu. Retired pay is suspended during the tenure of the appointment, but a gratuity in respect of each complete month's service in the post will be payable. Lieutenant-Colonel W. S. Poe, D.S.O., was the first occupant of this post.

Early in 1932, an order was issued whereby the privilege of appointment as Honorary Colonel Commandant, Royal Marines, was extended to Admirals of the Fleet or Admirals on the active or retired lists, instead of being limited to General Officers of the Corps. Admiral of the Fleet Sir Roger Keyes was afterwards appointed Honorary Colonel Commandant of the Portsmouth Division as from March 31, 1932.

#### ROYAL NAVAL RESERVE.

From various causes, the strength of the Royal Naval Reserve has declined in late years. The average bearing of officers, for example, in 1932 was 1,604, which compared with 1,619 in 1931; 1,628 in 1930; and 1,665 in 1929. With the reduction in the strength of the Royal Navy, the maintenance of the R.N.R. is more than ever necessary. It is much to be desired that the shipping companies will continue to do all they can to encourage young officers to join the Reserve.

#### ROYAL NAVAL VOLUNTEER RESERVE.

The Royal Naval Volunteer Reserve has also been influenced by the economy measures of the past year. From January, 1932, changes were made in its organisation and at the same time steps were taken to improve its efficiency in relation to the cost. The whole question of the voluntary training of the force was considered, and it was decided to suspend this training, and to concentrate on the obligatory training. Savings were made by closing down the sub-divisions at Manchester, Newport, and Eastbourne. The two sub-divisions at Hastings were reduced to one. The effect of the changes was shown in a reduction in the permanent staff of the

R.N.V.R. Divisions and drillships in the 1932 Estimates from 176 to 166 officers and men, ship-keepers, and civilian writers.

The institution of a Royal Naval Wireless Auxiliary Reserve (R.N.W.A.R.) in Great Britain and Northern Ireland was announced by the Admiralty on August 19, 1932. It is being recruited largely from wireless amateurs owning transmitting sets, and the object is to provide a reserve of operators trained in naval procedure for service afloat or ashore in war or emergency.

#### WARRANT OFFICERS' TRAINING.

In Fleet Orders dated June 17, 1932, it was announced that in order to be eligible for confirmation in rank, acting gunners, acting gunners (T), and acting boatswains promoted from the date of the order would be required to be in possession of a watchkeeping certificate certifying that they had kept watch at sea and in harbour under a commissioned officer and had a sound knowledge of the duties of officer of the watch, including measures necessary for the safety of the ship. The training of these officers in watchkeeping is to be continued after confirmation, in accordance with article 360 of the regulations, notwithstanding the possession of a watchkeeping certificate.

#### MECHANICAL TRAINING.

H.M.S. Figgard, after twenty-six years' duty as a training establishment for boy artificers, was paid off at Portsmouth on January 14, 1932, into the charge of a care and maintenance party. The Figgard I (late cruiser Spartiate), Figgard II (late broadside ironclad Hercules and afterwards known as the Calcutta), and Figgard III (late cruiser Terrible) were placed on the sale list. The Figgard IV (late armour-clad Sultan) was moved to the Dockyard and berthed permanently in No. 9 berth west in the pocket of No. 3 basin. From January 1, 1932, the new Mechanical Training Establishment at Chatham took over the work formerly done in the Figgard. Engineer Captain F. S. Carlisle was appointed in command.

#### Loss of M.2.

As in 1931, when the Poseidon was lost, the year was again marred by a submarine accident involving heavy loss of life. Submarine M.2 dived off West Bay, Portland, at about 10.30 a.m. on January 26, 1932, and no further communication was received from her. Although a search was promptly instituted, the vessel was not located until February 3. Seven officers and fifty-three petty officers and ratings were on board M.2 when she dived, and all were lost. On April 5, the First Lord stated in the House of Commons that no conclusive evidence had been obtained as to the exact cause, and it was unlikely that the true explanation would be discovered until the vessel was salvaged. After various unsuccessful attempts under adverse conditions, the salvage of the vessel was finally abandoned on December 8. The Admiralty commended the magnificent work done during the previous ten months by the divers and all concerned.

## II.—DOMINION NAVIES.

## AUSTRALIA.

In February, 1932, the Federal Cabinet decided to reverse the policy of its predecessor and to reopen the Jervis Bay Naval College. Entries of cadets had been suspended for two years. It was decided to resume them (a) by special entry in September, 1932, of boys born in 1917 and 1918; and (b) by normal entry in January, 1933, of boys born in 1919.

The only change during the year in the material of the Australian Navy was the scrapping of two sloops. The Mallow was turned over to Cockatoo Island Dockyard on July 25, 1932, for breaking up; and the Marguerite followed suit on September 26, 1932.

The cuts in pay made under the Financial Emergency Act, which became effective on July 16, 1931, led to certain manifestations of dissatisfaction in November, 1932, and meetings of protest were held on shore. The hardship felt by married seamen was exploited by agitators, apparently Communists, according to a statement made by Sir George Pearce, Minister of Defence, on November 9. He added that the effort to provoke a mutiny had failed, and the ships, fully manned, left that day according to schedule for Jervis Bay. The men's grievances related chiefly to deductions in pay and the curtailment of provision allowances. The Naval Board had recognised the justice of most of their claims, and had completed arrangements to make concessions before the men's meeting was held.

## CANADA.

The Report of the Department of National Defence on the Naval Service for the fiscal year ended March 31, 1932, showed that the personnel authorised was 104 officers and 792 ratings. The complement of ratings was full, but there were only eighty-six officers, including eight R.N. officers on loan. The urgent requirement of the Service is a greater number of junior officers. Of the nine candidates for entry during 1932, three were successful, and joined H.M.S. Erebus at Devonport in September.

The four destroyers in commission were employed on training duties, and all completed periodical cruising programmes, in the West Indies and elsewhere. The Vancouver carried out a Pelagic Seal Patrol for the Department of Fisheries.

The total expenditure on the Service during the fiscal year 1931-1932 was 3,043,509.75 dollars.

## NEW ZEALAND.

A Commission on Naval Expenditure which reported in March, 1932, recommended that negotiations be opened with the British Government to resume control of the New Zealand Division of the Royal Navy in return for a fixed annual subsidy. A reduction of

the Singapore vote by £50,000 was also suggested. No action had apparently been taken on these recommendations up to November.

The cruiser Dunedin was completed to full crew at Chatham on May 26, 1932, after a long refit, and her return to duty brought the Division up to its normal strength. The sloops Laburnum and Veronica continued to be attached to the Division.

#### AFRICA.

No change occurred during the year in the composition of the South African Naval Service, and its vessels continued to train officers and men of the South African R.N.V.R. The training ship *General Botha* also continued her useful work. In May, 1932, Lieutenant-Commander M. R. Jones, R.N., retired, was appointed chief officer of this ship, in succession to Lieutenant Considine, who became Assistant Superintendent of the Cape Town Fire Brigade.

An inspection of the vessels of the South African Naval Service was held on April 12, 1932, by the Commander-in-Chief, Vice-Admiral H. J. Tweedie.

By an Order in Council published in the *London Gazette* on November 18, 1932, the King approved, so far as was required by the Colonial Naval Defence Act, 1931, of the raising of a force for naval defence in the Colony of Kenya, entitled the Kenya Royal Naval Volunteer Reserve.

### III.—THE YEAR'S EVENTS.

So far as the reduced appropriations for fuel permitted, the ships and squadrons have carried out a fair amount of cruising during the past year. An outstanding event was the inspection of the Home Fleet by the King, for the first time since July, 1924. His Majesty, accompanied by the Prince of Wales and Prince George, embarked in the *Victoria and Albert* at Portsmouth on July 11, and joined the Fleet in Weymouth Bay. There were forty-six ships present under the command of Admiral Sir John Kelly, with his flag in the *Nelson*. They included five battleships, two battle cruisers, two aircraft carriers, five cruisers, four flotilla leaders, twenty-two destroyers, five submarines, and the sloop *Snapdragon*. The King spent four days with the Fleet, and in addition to inspecting certain ships, and holding a march past in the *Nelson* and the *Hood*, he accompanied the squadrons and flotillas to sea and witnessed exercises. On leaving, the King made the following signal: "At the conclusion of a most interesting and enjoyable visit to the Home Fleet, I wish to assure you of my entire satisfaction with all that I have seen. Since I last inspected the Fleet considerable reductions have been made, but I am gratified to see that in efficiency and keenness the standard of the Fleet under your command remains as high as ever. I congratulate all officers and men, and I look to them to maintain at all times the honoured traditions of the Service."

For the second year in succession, as part of its spring cruise, the Home Fleet detached some of its principal ships to visit the West Indies. The ships were the Hood and Repulse, of the Battle Cruiser Squadron, under Vice-Admiral Wilfrid Tomkinson, and the Dorsetshire, Norfolk, Exeter, and York, of the Second Cruiser Squadron, under Rear-Admiral E. A. Astley-Rushton. The ports in their itinerary were Barbados, Dominica, St. Kitts, Trinidad, Tobago, St. Vincent, Antigua, Grenada, St. Lucia, Montserrat, and Nevis. The importance of showing the White Ensign in these islands was recognised. At each port of call the vessels met with a most cordial reception.

The year 1932 provided several examples of the value of the Royal Navy for police duties all over the world in peace time. Indeed, the phrase "A British warship has been sent" has become so commonplace that the nation hardly realises the value of the influence for order and tranquillity, for succour in distress, and for humanitarian purposes generally exerted by its naval officers and men. Late in 1931 the Danae, Captain E. R. Bent, D.S.C., and the Scarborough, Commander A. W. S. Agar, V.C., D.S.O., were engaged on relief work following the disastrous hurricane at Belize, Honduras. About the same time, Rear-Admiral J. C. W. Henley was occupied at Cyprus with a force consisting of the London, Shropshire, Colombo, Acasta, and Achates in assisting to suppress rioting.

In January, 1932, there was a revolt in Salvador in which British life and property was threatened. The cruiser Dragon, Captain E. J. Spooner, D.S.O., was ordered to Colon to stand by in case she was needed, and the Canadian destroyers Skeena and Vancouver proceeded to Acajutla, where their presence had a reassuring effect. About the same time, ships on the China Station were at Shanghai for the protection of British interests during the Chino-Japanese fighting, and it was on board the cruiser Kent, flagship of Admiral Sir Howard Kelly, that a conference was arranged between the opposing forces. The British force at Shanghai on February 5 and subsequently included the cruisers Kent, Suffolk, Berwick, and Cornwall; the destroyer Wishart; and the gunboat Peterel.

During a period of unrest, the visit of the Effingham, flagship of Vice-Admiral Eric Fullerton, to Chittagong in the first week of January, 1932, was also useful. A party of bluejackets and marines were landed from her and marched through the streets on the occasion of the Commander-in-Chief's visit. In the same week, H.M.S. Carlisle, Captain F. R. Barry, from the Africa Squadron, was engaged on a humanitarian mission to the "world's loneliest island" of Tristan da Cunha. She carried the islanders' mail and stores contributed by public generosity to the eighty white inhabitants of this settlement in the South Atlantic. Following precedent, this visit was made the occasion of inquiry into the health of the people, and once again they were found to have no diseases and the only cause of death among them is accident or old age.

In April, there were three instances within a week in which appeals were made to British naval officers and men for assistance in preserving or restoring order. Because of the threat to the inter-

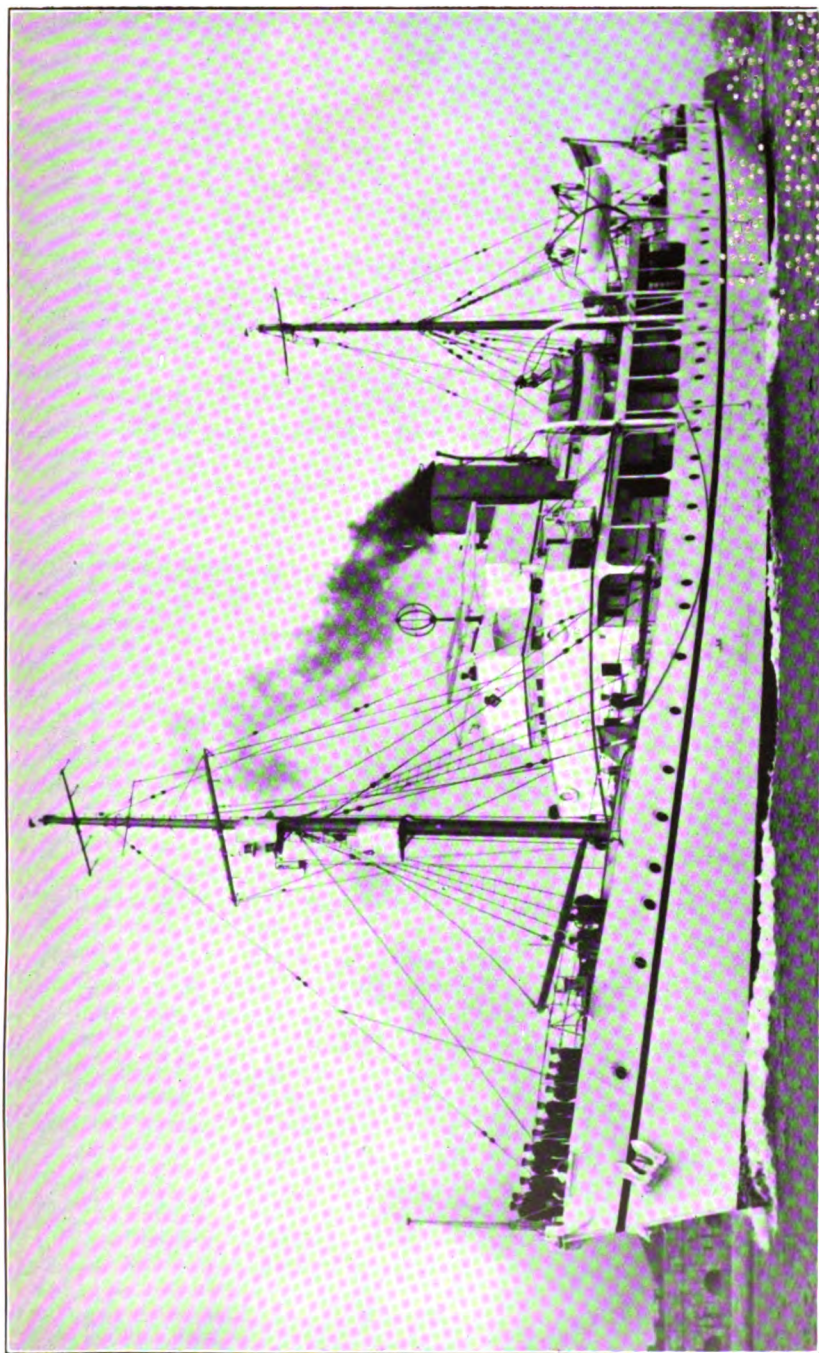


national settlement at Amoy from the advancing "Red" Army, the cruiser Devonshire, Captain D. B. Le Mottée, was ordered there from Hong Kong. At St. John's, Newfoundland, where there was an outbreak of disorder, and windows in the Legislature were broken, the cruiser Dragon, Captain E. J. Spooner, D.S.O., was sent. And at Auckland, where serious rioting followed a march of Civil Servants to protect against wage reductions, marines and sailors from H.M.S. Philomel were called upon to render assistance in restoring order.

On June 18, owing to the insurrection in Chile, the cruiser Durban, flying the broad pennant of Commodore R. H. O. Lane-Poole, O.B.E., arrived at Callao as a precautionary measure, and she remained in the vicinity for over three months.

During the 18 months ending on November 30, the Admiralty were called upon to send cruisers in cases of emergency, for the assistance of mankind in trouble, no less than 18 times, and when it is remembered that there are only 36 cruisers in commission, 29 of which are abroad, the extent of the call upon the Navy is manifest. As the Prince of Wales—shortly after his visit on behalf of the King to the Mediterranean Fleet—said in a speech on November 3, at the Nelson Day dinner of the Navy League, in its great work as a sea-going police force in all parts of the world, the Navy is a great instrument of peace at the present time. The relief work of officers and men after the New Zealand earthquake, their protection of British interests in the local rebellion at Madeira, their part in suppressing the revolt in Cyprus, and the protection of British interests during the fighting in Shanghai—these were incidents in their ordinary routine, said the Prince, and he mentioned them in order to emphasise how essential it was that the Navy should be properly represented on every sea.

CHAS. N. ROBINSON,  
Commander, R.N.



(Photo by Stephen Cribb, Southsea.)

**H.M. SURVEYING SHIP CHALLENGER.**  
*Commissioned at Portsmouth, March 15, 1932.*

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## CHAPTER II.

### FOREIGN NAVIES.

THE year 1932 was an outstanding one for the amount of attention given by all the Powers to disarmament generally and to the reduction of navies in particular. It was notable for demonstrating that the more disarmament is discussed, the more acute become the differences between what each nation believes to be essential for security.

One or two striking facts emerged from the welter of international arguing and manœuvring. Germany, whom it had been assumed was banished from any threat of further competition in armaments, proved to be a stumbling block, not merely to the reduction of the fighting forces of other nations, but even to the continuance of the long drawn-out Conference on the subject. The situation which arose was foreshadowed in this chapter in last year's "Annual," where it was pointed out that the construction of a new type of armoured ship for the German navy could not but provoke uneasiness and some sort of counter-action by France, and that this might result in a deadlock at the Disarmament Conference. The German government made it clear, not only that they intended to proceed with the modernisation of their fleet to the maximum extent permitted by the Versailles Treaty, but that, unless the principle of equal right to armaments was conceded to them, they would take no further part in the Conference. This was only a step towards saying that, unless other nations submitted to the restrictions imposed on Germany by the Versailles Treaty, she would refuse to be bound by it any longer. The French reply to the three "Deutschlands" of 10,000-tons armed with six 11-inch guns was to make provision for a 26,500 ton capital ship armed with eight 18-inch guns. We may yet be back to pre-War conditions of competition in capital ship design.

Meanwhile, the United States—at whose instigation the Powers have with all solemnity "outlawed war from their hearts"—proceeded steadily with their programme of construction of the largest type of cruiser. France and Italy, unable to agree with each other about relative naval strength, have continued to build, jealously, cruisers and so-called destroyers which in reality are also cruisers of a smaller type. Japan, Spain, the Netherlands, the Argentine, and even China are completing for their navies new ships of the cruiser class; and the greater proportion of these foreign cruisers are of a more powerful type than that of the ships building for the British Navy. Any tendency to slow down warship construction abroad was due solely to economic necessity. Our friends abroad regard the reluctance of successive British Governments to build up to the standard to which we have agreed to submit as a sign of weakness

TABLE "A."—WARSHIPS COMPLETED, BUILDING AND APPROPRIATED FOR DURING 1932.

NAVY.	Capital or Coast- Defence Ships.	10,000-ton cruisers.	Smaller cruisers.	Cruiser Minelayers.	Aircraft carriers.	Flotilla leaders.	Destroyers.	Escorteurs.	Submarine.	Sloops.	Coastal motor-boats or torpedo-boats.	Gunboats.	Minesweepers and Netlayers.
British Empire . .	..	..	10	..	..	4	28	..	12	13	..	2	..
United States . . .	..	8*	..	..	1	..	8	..	3	..	..	..	..
Japan . . . . .	..	4	2	1	1	..	8	..	6	..	2	..	2
France . . . . .	1	2	6	1	..	19	1	12	30	6	..	1	1
Italy . . . . .	..	3	7	..	..	..	11	..	29	..	5†	..	..
Germany . . . . .	3	..	..	..	..	..	..	..	..	..	..	..	..
Spain . . . . .	..	2	..	..	..	3	..	..	..	..	..	..	..
Denmark . . . . .	..	..	..	..	..	..	..	..	..	..	3	..	..
Finland . . . . .	2†	..	..	..	..	..	..	..	..	..	..	..	..
Greece . . . . .	..	..	..	..	..	..	4	..	..	..	..	..	..
Netherlands . . .	..	..	1	..	..	..	..	..	7	..	..	1	2
Norway . . . . .	..	..	..	..	..	..	..	..	..	1§	..	..	..
Poland . . . . .	..	..	..	..	..	..	1	..	1	..	..	..	..
Portugal . . . . .	..	..	..	..	1	..	4	..	2	5	..	2	..
Rumania . . . . .	..	..	..	..	..	..	..	..	1	..	..	..	..
Soviet Union . . .	..	..	..	..	..	..	..	..	?	..	..	..	..
Sweden . . . . .	..	..	..	..	1	..	2	..	2	..	4	..	..
Turkey . . . . .	..	..	..	..	..	..	2	..	2	..	..	..	..
Yugoslavia . . . .	..	..	..	..	..	1	..	..	..	..	..	..	..
Argentina . . . . .	..	..	..	..	..	..	..	..	3	..	..	..	..
Brazil . . . . .	..	..	..	..	..	..	..	..	..	..	..	1	..
China . . . . .	..	..	2	..	..	..	..	..	..	..	..	4	..
Persia . . . . .	..	..	..	..	..	..	..	..	..	..	4	2	..
Total, exclusive of the British Empire . . . . .	6†	19	18	2	4	23	41	12	86	12	18	11	5

\* One of the 10,000-ton cruisers is appropriated for but will not be laid down until 1933.

† Including two small torpedo boats.

‡ Coast defence vessels of 8,350 tons.

§ Minelayer and training ship.

|| Vedette boats of 241 tons.

if not decadence. Those who are not so well disposed, and who see their own navies growing in power daily, view the steady decline of the British Navy with a satisfaction which adds fuel to the fire of their ambitions.

TABLE "B."—FOREIGN SHIPS BUILDING, ORDERED OR COMPLETED DURING 1932 IN:—

Ordered by	GREAT BRITAIN.		ITALY.				FRANCE.		JAPAN.
	Sloops.	Fleetilla leaders or destroyers.	Sloops.	Destroyers.	Submarines.	Motor launches.	Destroyers.	Submarines.	
Argentine . . . . .	..	..	..	..	3	..	..	..	..
China . . . . .	..	..	..	..	..	..	..	..	1
Greece . . . . .	..	..	..	4	..	..	..	..	..
Persia . . . . .	..	..	2	..	..	4	..	..	..
Poland . . . . .	..	..	..	..	..	..	1	1	..
Portugal . . . . .	2	2	..	..	..	..	..	..	..
Rumania . . . . .	..	..	..	..	1	..	..	..	..
Turkey . . . . .	..	..	..	2	2	..	..	..	..
Yugoslavia . . . . .	..	1	..	..	..	..	..	..	..
Total . . . . .	2	3	2	6	6	4	1	1	1

### UNITED STATES.

The financial crisis in the United States and the Hoover proposals to the Disarmament Conference combined to check the realisation of the ambitions of the Big Navy party, as represented in the "Vinson" Bill. The latter was a measure laid before Congress by the chairman of the House Naval Committee early in 1932 with the object of providing for the construction of 120 new warships at a total cost of 616,250,000 dollars. The Bill asked for the immediate appropriation of 18,000,000, and for annual sums ranging from 80,000,000 to 90,000,000 dollars to be spread over the following ten years. It was designed to give effect to the policy of building up to the full strength permitted by the London Treaty. However, President Hoover opposed any increase to the navy beyond the construction already laid down, and even the modernising of the capital ships which remained to be taken in hand for this purpose was slowed down.

The Naval Appropriation Bill for 1932 was approved in June. It made provision for a total expenditure of 317,583,591 dollars, a reduction of 40,678,582 dollars on the previous fiscal year, and of 24,093,859 dollars on the budget estimates. Actual expenditure by the Navy Department for the fiscal year ending June 30, 1932, was 357,617,833 dollars. This represented a saving of 21,295,267 dollars on the budget estimates.

D



## NEW CONSTRUCTION.

Of the remaining seven 10,000-ton cruisers building at the beginning of 1932, the Indianapolis is complete and the Portland was due to commission by the end of 1932. The New Orleans, Astoria, and Minneapolis should join the fleet during 1933, and the Tuscaloosa and San Francisco in 1934. When the Portland was launched on May 21, 1932, the unusual step was taken of excluding the general public from the ceremony. The reason given was that acts of vandalism had been committed by disgruntled workmen against other vessels under this section of construction.

In each of the three years 1933, 1934, and 1935 the United States may, under the London Treaty, lay down a 10,000-ton cruiser. It remains to be seen, however, whether the Disarmament Conference will modify this programme, and also whether, in any event, the naval authorities prefer to exercise their option of building cruisers of the 6-1-inch gun type to the extent of 15,166 tons in substitution for each 10,000 ton 8-inch cruiser. Hitherto American naval opinion has favoured the larger gun type as being a better match for the large armed merchant ship; but economic necessity may assist realisation of the fact that it is not necessary to use a sledge-hammer to crack an eggshell. All the fifteen 10,000-ton cruisers built or building for the United States Navy have an armament of nine 8-inch guns, except the Pensacola and Salt Lake City, which have ten of these weapons. The fifteen British 8-inch cruisers, including two Australian ships, mount eight of these guns each, except the York and Exeter which only carry six. There was much discussion regarding 6-inch cruisers, both as regards design and their inclusion in new construction programmes, but no definite decisions were reached. Admiral Moffet, Chief of the Bureau of Aeronautics, was amongst those who favour the adoption of a type of 6-inch cruiser with a flying deck.

The aircraft carrier Ranger is about 50 per cent. complete, and is due to join the fleet by May, 1934.

The names of five great American commanders have been given to the destroyers ordered in 1931. They will be called the Farragut, Dewey, Hull, MacDonough, and Worden. In September, 1932, it was decided that the construction of three more destroyers, which had been suspended as a measure of economy, should be proceeded with at once in order to relieve unemployment.

Of the three submarines of the 1929-30 programme, the Dolphin was due for completion by the end of 1932, and the Cachalot and Cuttlefish are due to join the fleet in the latter part of 1933.

## HIGH COMMANDS.

Some important changes occurred during 1932 in the high commands. Admiral Richard S. Leigh relieved Admiral Frank H. Schofield as Commander-in-Chief of the United States fleet. The latter joined the General Board. Admiral Leigh was succeeded by Admiral Luke McNamee in command of the battleships of the Battle

Force. Vice-Admiral Arthur L. Willard joined the General Board and was relieved in command of the Scouting Force by Vice-Admiral Frank H. Clark.

#### FLEET MOVEMENTS.

On May 20, 1932, it was announced that the Scouting Force was to remain on the West coast until October. Originally the concentration of the United States Fleet in the Pacific was to have ended in May. The official reason for the change of programme was that it was made in the interests of "fleet operating efficiency." It seems most probable, however, that events in the Far East were the real reason for the retention of naval forces in those waters. In the early part of the year, annual manoeuvres on an extensive scale were carried out; the two main exercises being an attack on the Hawaiian Islands, and a scheme in which the object of one side was to seize a base on the West coast of the United States.

#### NAVAL AIR FORCE.

Congress granted a sum of 220,000 dollars to the Navy Department for the development of high-speed flying. Admiral Moffet proposed to devote this to the production of a high-powered engine which will ultimately enable trials to be made of the value of very high-speed aircraft to naval aviation. The United States Marine Corps is now represented in the Naval Air Service, and early in the year a Marine Corps Observation squadron embarked in each of the carriers Lexington and Saratoga. Each squadron consists of six aircraft, eight officers, and about thirty-five men.

The naval airship service was steadily developed. The Los Angeles, after years of good service, was paid off and replaced by the new 6,000,000 cubic feet rigid Akron. The still larger Macon is nearing completion. Eventually one of the airships will be based on the East and the other on the West coast.

#### NEW CONSTRUCTION INCREASE.

In President Hoover's Budget message to Congress on December 7, 1932, new naval construction recommended was to cost 38,845,000 dollars, an increase of 21,000,000 dollars. Besides continuing work on ships in hand, the Estimates allowed for three battleships to be modernised; one 8-in. gun cruiser to be laid down in January, 1933; a similar vessel in January, 1934; and four destroyers during 1934. Air Force Estimates provided for the construction of 375 new aeroplanes, making a total of 1,537.

#### JAPAN.

##### CLASSIFICATION.

It is of interest to note that in the 1932 British Admiralty official return of fleets the three Kongos were classified as battleships instead

of battle cruisers. Possibly this was due to their low speed—nominally 26 knots, as compared to the 31 knots of our “Hood” and “Repulse” class. The effect of this change is that the three British ships are the only ones now officially classified as battle cruisers.

#### NEW CONSTRUCTION.

The Chokai, the last of the eight 10,000-ton cruisers which Japan may build under the London Treaty, was completed at the end of 1932. The Atago, Takao, and Maya joined the fleet earlier in the year. As foreshadowed in this chapter of last year's “Annual,” the new class of cruisers are vessels of 8,500 tons. They will be armed with no less than fifteen 5-inch guns. This is a new design of naval ordnance, and will probably prove to be little, if at all, inferior to the 5.5-inch weapons mounted in the Sendai class of light cruisers. Two more ships of about the same displacement are projected. It is possible that one of the four will be constructed as a flying-deck cruiser.

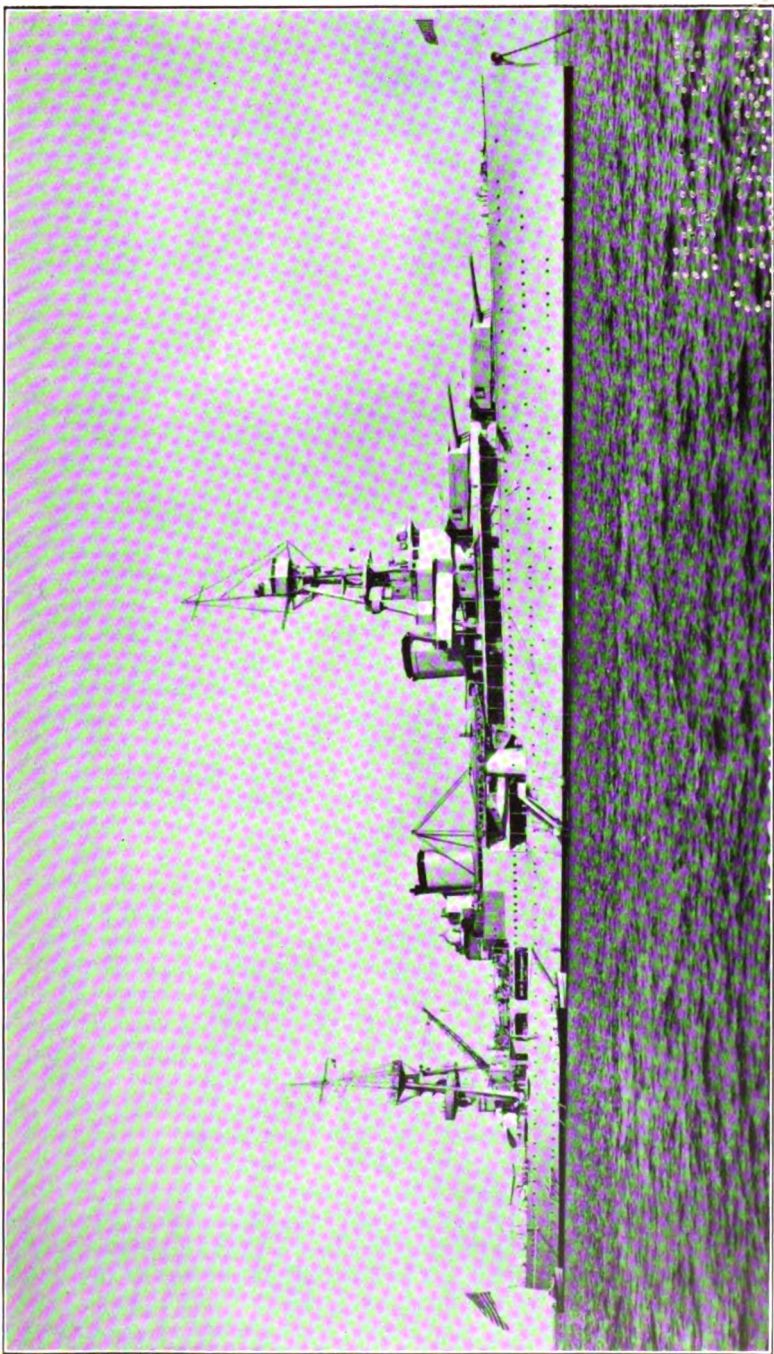
Details of Japanese naval construction released for publication are meagre, but there appears to be a strong tendency to build ships more powerfully armed and better protected, and to obtain these advantages at the expense of the radius of action. This seems to indicate that, in the event of war, Japan would not seek to join action in enemy waters, but would prefer to engage a hostile fleet nearer her own ports, where she would be at a considerable advantage strategically, and possibly also tactically—a very logical policy for a nation without overseas naval bases.

The aircraft carrier Ryujo and the layer Yayeyama were due for completion by the end of 1932. A second layer has been laid down.

Of the 1,700-ton destroyers of the “Sazanami” class, laid down in 1930, the remaining three are nearing completion. They carry six 5-inch guns, and their engines of 40,000 H.P. are designed to give a full speed of 34 knots. A group of three ships of a smaller class, displacing only 1,378 tons, is also building, and nine similar vessels are projected.

#### MISCELLANEOUS.

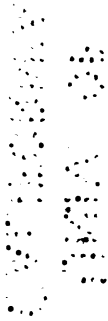
Vice-Admiral Tsuneyoshi Sakano has succeeded Vice-Admiral Koichi Shiozawa as Commander-in-Chief of the first division of naval forces abroad, and in the waters of the Yangtse. A number of vessels which had reached the age limit have been removed from the active list during the past year, and are being scrapped. They include the coast defence ship Manshu, thirteen torpedo boats and a number of old and small submarines. In June last the training cruiser squadron under Vice-Admiral Imamura visited New Zealand waters. It was decided in November, 1932, to dismantle the Naval Airship No. 7, the only one of its kind in Japan, owing to the high cost of repairs.



THE U.S. CRUISER CHICAGO, 9,300 TONS.

*Completed 1931.*

*(By courtesy of the U.S. Navy Department.)*



## FRANCE.

## ESTIMATES.

The naval estimates for the last nine months of 1932 were passed in March and showed a total increase as compared with those for the corresponding period of the previous year amounting to 90,700,000 fr. (£781,000 gold). This increase was principally due to greater productions costs. The total sum allocated to new construction amounted to 1,730,000,000 fr. (£13,900,000 gold).

## NEW CONSTRUCTION.

The 1932 programme, as passed by the French Chamber at the end of the previous year, made provision for four cruisers of 7,800 tons to be armed with nine 6-inch guns and to have a speed of 32 knots; one large flotilla leader, one destroyer, one survey vessel, and a river gunboat. The cost of this programme was to be spread over six years. In addition, designs were approved by the Naval Committee of the Chamber for the new capital ship to be built as the reply to the German *Deutschland*. This ship will displace 26,500 tons, carry eight 13-inch guns in two quadruple turrets, and eight 6·1-inch guns. She will have a speed of 29 knots. She will mount a powerful anti-aircraft armament and be well protected. The estimated cost is 580,000,000 fr. (£4,800,000 gold). It remains to be seen whether the design will be modified as a result of the British proposals to limit the size of future capital ships, but it may be taken for granted that the ship as finally constructed will be definitely superior to the German design, which, of course, is limited by the Versailles Treaty to 10,000 tons. Parliament ratified the decision to build the vessel, which is to be called the *Dunkerque*, and orders were given for her keel to be laid down at Brest in October last.

The four cruisers will be of the "Jean de Vienne" class. They were assigned the names *Gloire*, *Marseillaise*, *Montcalm*, and *Chateaurenault*. It was proposed that one shall be built at the Naval Arsenal and the remainder by contract. As a measure of economy, however, the whole of the 1932 construction programme has been held up, and none of the ships for which provision had actually been made was laid down according to plan.

The 10,000-ton cruiser *Algérie* was launched at Brest on May 21, 1932, she is the seventh vessel of this class, and for the time being, the last. With engines of 84,000 H.P., instead of the 90,000 H.P., of her immediate predecessor, the *Dupleix*, she will have a speed of 31 instead of 32 knots, but she will be better protected in every way. In appearance, too, she will differ from earlier ships of the class as she will have but one funnel and one mast. What is claimed to be the record speed obtained by any warship was that of the new flotilla leader *Cassard* on her trials off the Finisterre coast in September, 1932, when she reached 43·4 knots. The average speed for three hours was 42·9 knots, but as remarked in this "Annual" before, these spectacular results do not represent what the ships can



do under active service conditions, and are, therefore, not comparable to the speeds obtained on the trials of British-built warships. The numerous vessels of this and a similar class displace over 2,400 tons, and carry an armament of five 5.5 guns and six or seven torpedo tubes.

#### PERSONNEL.

On the formation of M. Tardieu's government in February, 1932, a reduction was made in the numerical strength of the Cabinet as a measure of economy. The most important change was the merging of the Ministries of War, Marine, and Air into one Ministry of Defence. This met with much opposition and criticism, and the new government had but a short life. When M. Heriot succeeded to the premiership on May 10 he lost no time in re-establishing the three separate ministries. At the same time, however, a new High Commission was appointed to co-ordinate the requirements of national defence. This body is similar to that of our Committee of Imperial Defence. The new Minister of Marine was M. Georges Leygues, who previously held the same office for five years, and who has done more than any other member holding that office in modern times to promote the efficiency of the fleet.

As an indication of the rate of entry of officers for the French navy, it is worth noting that in 1932 there were eighty-four vacancies for the Naval School—seventy for the Navy proper, and fourteen for the Naval Air Service. Aviation is, however, part of the curriculum of all officers, and they may be detached to perform any flying duties required of them by the Ministry of Marine.

#### SUBMARINE ACCIDENTS.

The new submarine *Prométhée*, a vessel of 1,379 tons surface displacement, foundered off Cherbourg on July 7, 1932, whilst carrying out acceptance trials. Sixty-two officers, crew, and dockyard workmen lost their lives. A committee of inquiry, after carrying out experiments in the sister ship *Archimède*, reported that a compressed air valve was opened in error at the moment of switching over from the electric to the Diesel engines, thus admitting water and causing the submarine to dive. The Italian salvage ship *Artiglio* was sent for and the *Prométhée* was located in about 27 fathoms, but all signs of life were extinct. Messrs. Cox and Danks, who have salvaged so many ships of the High Sea Fleet at Scapa Flow, were consulted, but advised against salvage operations which the Ministry of Marine decided not to undertake.

On September 26, 1932, when the submarine *Persée* was undergoing trials between the Channel Islands and the French coast, a serious explosion occurred in the engine-room. A dockyard engineer was killed and two of the crew subsequently died from their injuries; thirty more were more or less severely hurt. The submarine was taken in tow and returned to Cherbourg.

## ITALY.

The estimated expenditure on the navy for 1932-33 is 1,538,923,277 lire. The amount to be devoted to new construction is 725,000,000 lire, approximately the same as in the previous year.

## NEW CONSTRUCTION.

The 1931-32 programme of new construction was announced by Admiral Guiseppe Sirianni, Minister of Marine, in April, 1932. It provided for two cruisers and two torpedo boats. The cruisers will be vessels of 6,700 tons, and in design they will be improved "Condottieri" class, and are to be well protected. They are to be named the Eugenio di Savoia and the Emmanuele Filiberto. The torpedo boats will be of about 625 tons. The four vessels were all laid down in 1932. Of the 10,000-ton cruisers the Bolzano and Gorizia were completed during 1932, and the Pola, which was launched in December, 1931, should be ready to join the fleet during 1933. No more ships of this class, are at present building or projected. In addition to the two cruisers of the 1931-32 programme already mentioned, there are eight of a lighter class.

Signor Mussolini on December 2, 1932, gave orders for the construction of two more 7,000-ton cruisers and two torpedo boats, being part of the programme fixed for 1932-33.

## REORGANISATION OF THE FLEET.

After the summer manœuvres, the fleet was completely reorganised, with the object of creating squadrons of homogenous cruisers, each with its attached group of destroyers. Each of the two squadrons was sub-divided into two divisions. The first division of the first squadron consists of the 10,000-ton cruisers Trieste (flag), Trento, and Bolzano, and the attached destroyer flotilla is composed of vessels of the new "Freccia" and "Folgore" class. The second division is formed by the big cruisers Gorizia (flag), Fiume, and Zara, to which in due course will be added the Pola; the flotilla consists of destroyers of the "Zeffro" and "Nembo" classes. The second squadron will consist of the new light cruisers, and twelve flotilla leaders—eight in commission, four in reserve. A separate force is allocated to the Adriatic, consisting of the old cruiser Bari (flag) and a certain number of flotilla leaders and minor vessels. The four battleships and the remaining *ex*-Austrian ships form the reserve.

## NAVAL MANŒUVRES.

During August, 1932, extensive manœuvres were carried out in the waters between Italy and the North African coast. They were given much publicity in the Italian Press. The objects of the manœuvres were (1) to examine the systems of protecting convoys; (2) to test communication services; (3) to develop co-operation between the Navy and the Air Force; and (4) to test the efficiency

of the coast defence and training squadrons. The first phase began on August 8 and lasted until the following night. In this the enemy force "B" had to endeavour to effect a junction between two convoys from Bengazi and Tripoli and escort them to "friendly" ports in the Gulf of Taranto. The "national" force "A" had to inflict the utmost damage to these convoys *en route*. Force "A" successfully met and kept contact with force "B." On the evening of August 9 "A's" torpedo craft attacked vigorously. "B" was adjudicated to have lost a battleship, a cruiser, a destroyer, and five ships of the convoy sunk, while a second battleship was torpedoed and her speed reduced to 14 knots. Force "A" lost two cruisers and two destroyers. The second phase started on August 10, and was mainly devoted to air reconnaissance and air attacks on the convoy and counter-attacks on the enemy. On August 13 the King of Italy embarked in the cruiser Zara and proceeded to sea to witness tactical and firing exercises. On the following day he reviewed the combined fleet and air forces off Taranto. The Italian naval activities caused much comment in the French Press. The view was expressed that the scheme was really intended to test the possibility of Italy interfering with the transport of French troops from North Africa, and that the results of the manœuvres had shown that the Italian navy now constitutes a real danger to the French plans for mobilisation.

#### GERMANY.

The strong revival of national feeling in Germany was reflected in the decision of her government to take no further part in the Disarmament Conference until the principle that she has an equal right to arm was accepted by the other Powers. So far as the Navy is concerned this implies that, unless those Powers agree that the restrictions imposed on Germany by the Versailles Treaty shall, in some measure at least, apply to themselves, Germany will claim her freedom to build warships of over 10,000 tons, to possess as many vessels of each class as she desires, and to resume the construction of submarines. Whether in existing conditions of economic depression, and in spite of outside pressure, she will really attempt to build a more powerful fleet seems very doubtful. Meanwhile, perhaps as a gesture of defiance, she chose the moment of breaking off negotiations at Geneva to lay down a third 10,000-ton battleship. This, however, she was fully entitled to do under the Versailles Treaty. The ship will be a replica of the Deutschland, details of which have already been given in the "Annual."

The trials of the machinery of the Deutschland, which includes eight 6,250 b.h.p. M.A.N. double-acting two-stroke engines running at 450 r.p.m., and driving the propeller shafts through hydraulic reduction gear, were carried out in 1932 with success. It was stated that the noise was a little disturbing, but that as regards vibration the performance was quite satisfactory.

The Naval Estimates for 1932-33 published in May, 1932, include the final grant for completing the Deutschland (which will cost

about £3,750,000 gold), a further instalment for the second ship, the Ersatz-Lothringen, and a first instalment for the Ersatz-Braunschweig. It is proposed to lay down a fourth ship, the Ersatz-Elsass in 1933.

The German fleet to-day consists of four ships of the line—the old battleships Hessen, Hanover, Schleisen, and Schleswig-Holstein;—the Braunschweig and Elsass in “armed reserve”; and eight cruisers, the Berlin, built in 1903—the five post-War ships Emden, Königsberg, Karlsruhe, Köln, and Leipzig, and the old Hamburg and Amazone in “armed reserve.” Twenty-six destroyers are retained in active service and two in “armed reserve.” Under the Versailles Treaty Germany may build four more of these craft, provided they do not exceed 500 tons displacement. There is also the gunnery training ship Bremse.

#### LOSS OF A TRAINING SHIP.

The naval training ship Niobe capsized under sail when she was struck by a sudden squall off Fehman in the Baltic on July 26, 1932. Sixty-nine officers, petty officers, and naval cadets were drowned. Forty survivors were rescued. The Niobe was barque rigged and had been acquired for the navy in 1922 as a training ship for cadets. The disaster meant the loss of the greater part of a year's recruits for the commissioned ranks of the fleet. The Niobe was raised and taken into Kiel Fiord. The operation was a difficult one, and the rapidity with which it was carried out makes it worthy of record as a particularly efficient piece of salvage work. It is proposed to build a new Niobe, and funds are being raised for this purpose by public subscription.

#### SPAIN.

The navy appears to be settling down satisfactorily under the republican regime, and there are no indications that the fleet will be allowed to fall off either in strength or efficiency. A full account of the principal changes in the organisation and administration will be found in last year's “Annual.” Work on the 10,000-ton cruisers Baleares and Canarias, which was slowed up at first after the revolution, is now proceeding steadily. The Baleares was launched at Ferrol on April 21, 1932. The Canarias, launched eleven months earlier, was due for completion late in 1932.

A serious loss to the Navy was sustained by the sinking of the light cruiser Blas de Lezo in July, 1932, when she ran on a reef near Cape Finisterre. The ship had left Vigo to take part in exercises. She was proceeding at high speed when she struck the Centollo shoal. The crew were all taken off and the Blas de Lezo was refloated, but sank in 33 fathoms while being towed into shallow water. The Mendez Nunez grazed the same shoal and was badly damaged. These two vessels were sister ships—medium-sized cruisers of 4,650 tons carrying six 6-inch guns—and both were laid down in 1922. Earlier in the year the flotilla leader J. Luiz Diez also ran aground off Irice and was badly damaged. She was refloated and taken to Cartagena for repairs.

## PERSONNEL.

By a decree of July 24, 1931, the number of Rear-Admirals was limited to six, but this number was increased by one during 1932 in order to provide for a Rear-Admiral as Second Chief of the Military Cabinet of the President of the Republic.

Naval cadets complete their training by doing a nine months' cruise in the training ship Sebastian Elcano, a sailing vessel with auxiliary diesel engines. During 1932 she visited a number of foreign ports, including New York, carrying forty-eight cadets. A large party visited the naval academy at Annapolis.

## OTHER EUROPEAN NAVIES.

## DENMARK.

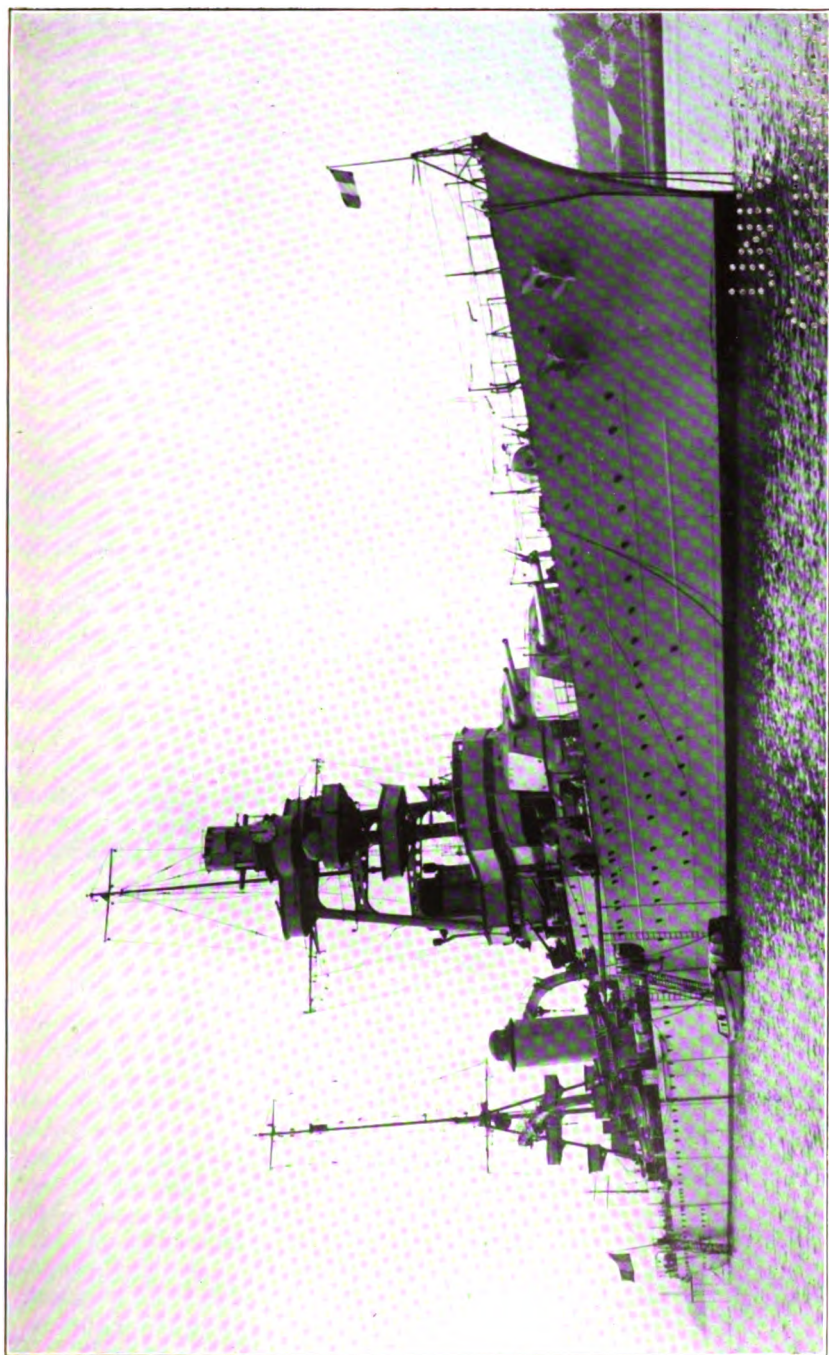
The Danish Navy has been the subject of much political conflict of late years. One section of opinion desires to see it modernised and made into a force which shall at least command respect for Denmark's interests as a neutral; the other argues that the fleet is so ineffective that it is merely a danger to itself and should, therefore, be further reduced or abolished. For the present, at any rate, a mean course appears to have been adopted which, while it effects certain economies, will not surrender the country's naval prestige altogether.

In April, 1932, the Navy was re-organised. Under the new regime the total personnel was reduced by about one-third, and is now only 760 officers and men. The fleet consists of 1 armoured ship, 6 torpedo boats, 1 mining vessel, 6 submarines, 1 repair ship. Except in the case of the submarines, which are manned all the year round, the ships are only commissioned for periods of 90 days or less for annual exercises and cruises. The coast defence ship *Herluf Trolle*, the torpedo boats *Ornen*, *Delfinen*, and *Svaerdfisken*, and the submarines *Havfruen* and *Nymfen* have been removed from the effective list. The naval budget is limited to 11½ million Kroner. Of this Kr. 2,200,000 is allotted to new construction. This only consists of the three small torpedo boats *Gelenten*, *Hogen*, and *Ormen*, which were laid down during the past year. Provision has also been made for a new fishery inspection vessel the *Fylla II*—to replace the existing *Fylla* (ex-British sloop *Asphodel*); this vessel will be similar to the *Hvidbjørnen*, but of larger displacement. She will carry four guns, two 120 mm., and two 57 mm., and will have machinery to develop 3,000 H.P.

The Naval Air Arm is being developed, and it is understood that it is being equipped with torpedo-bombers of the British Hawker "Horsley" type.

## FINLAND.

Construction of the armoured ships *Vainamoinen* and *Ilmarinen* is proceeding, and the former is nearly completed; the latter should also commission in 1933. These are most interesting vessels, and



THE FRENCH CRUISER FOCH, 10,000 TONS.

*Completed 1931.*

*(By courtesy of the French Ministry of Marine.)*





with their armament of four 10-inch and eight 4·7-inch guns, should have something of the appearance of miniature reproductions of the battleships of the pre-Dreadnought era. In other respects, however, they are of entirely modern design, both as regards mountings, fire control, diesel engines, and the system of armour and under-water protection. They will make the Finnish Navy a force to be reckoned with in the Baltic.

The sailing training ship *Suomen Joutsen* returned from her first cruise, which lasted about five months, in May, 1932. She was originally called the *Oldenburg*, and was purchased from Germany.

#### GREECE.

On grounds of economy, the contracts with the British Naval and French Military Missions were terminated at the request of the Hellenic Government. The former, which consisted of five officers under Captain L. E. Holland, R.N., returned to England in August, 1932, although normally they would have remained in Greece until May, 1933. The naval authorities and the Greek Press paid warm tributes to the work of the British Mission.

Pending the results of the Disarmament Conference no new construction was put in hand during 1932. Of the four destroyers ordered from the Odero firm at Genoa in October, 1929, three were launched in 1931 and one in 1932.

#### LATVIA.

The Latvian Navy has now been in existence for over eleven years—the tenth anniversary was celebrated with much rejoicing in 1931. It only consists of one gunboat, two minesweepers, and two small submarines, but the four latter are modern. Although few in number, the ships are reported to be quite efficient. There is the nucleus of a naval air service.

#### NETHERLANDS.

The provision of funds to meet the upkeep of the Navy and new construction for the fleet in the Dutch East Indies became a matter of some difficulty, owing to the serious fall in colonial revenue. Nevertheless, work on the ships already laid down proceeded, and the contract was placed with Wilton-Fijenoord of Rotterdam for a third cruiser. The Minister of Defence, however, announced that while the ship is building no new material for the joint account of the Netherlands and Netherlands East Indies shall be laid down. This means that the programme of six displacement submarines, one minelaying submarine and two destroyers, which was to have been undertaken before 1936, is now postponed for some four years. On the other hand, this does not preclude new construction being undertaken at the exclusive cost of the home Government.

Submarines O.14, O.15, K.14, and K.15 were completed during 1932; K.16, K.17, and K.18 are under construction. The minelayers *Gouden Leeuw* and *Prins Van Dranse* have also been com-

pleted and taken over by the Colonial Department of the Ministry of Defence for service in the East Indies. The personnel of the Dutch Navy in 1932 included the following executive officers: 5 Vice-Admirals (3 supernumerary), 3 Rear-Admirals, 20 Captains (6 supernumerary), 31 Lieutenant-Commanders, 361 Lieutenants, and 42 officer pilots.

#### POLAND.

The Polish Navy consists of two modern destroyers, three submarines, five older destroyers (*ex*-German torpedo boats), two gunboats for river work, various auxiliaries, and twenty motor boats. It is hoped to bring the strength up to four destroyers and nine submarines, all of a modern type. Considerable controversy took place in 1932 as to the right of Poland to use the free Port of Danzig now that she has her own harbour at Gdynia. On June 15, when a British flotilla visited Danzig, the Polish destroyer *Wiher* was sent to greet it, on the grounds that Poland conducts the foreign affairs of the city. The local authorities protested strongly. A few days later a German squadron visited the port and Poland was not represented.

#### PORTUGAL.

The four destroyers which, as reported in the 1932 "Annual," had been ordered for the Portuguese Navy have all been laid down; the *Vouga* and *Lima* are building at Messrs. Yarrow's works on the Clyde, and the *Tejo* and *Douro* are being constructed by the *Sociedade de Construcões e Reparacões Navaes* of Lisbon to Yarrow designs. The machinery of all four craft is being supplied from the works of the British company at Glasgow.

Two second-class sloops, designed for service in the Portuguese colonies, are being built by Messrs. Hawthorn, Leslie & Co., at Hebburn. The first of these, the *Goncalo Velho*, was launched in August, 1932, and the second, the *Gonçalves Zarco*, on November 28. They are of about 1,000 tons and 2,000 horse-power. Two first-class sloops, which had been assigned the names *Alfonso-de-Albuquerque* and *Bartolomeu Diaz*, and which had been ordered from the Orlando works in Italy, have been cancelled, although appropriated for. On December 4, 1932, it was announced at Lisbon that the Government had ordered two sloops from Messrs. Hawthorn Leslie and Co.; three submarines from Vickers-Armstrongs, Ltd.; and a destroyer from Messrs. Yarrow and Co.; as well as 11 aeroplanes from the De Havilland Company.

#### SOVIET UNION.

A statement made out for the League of Nations and published in February, 1932, gives the strength of the Soviet armed forces on January 1, 1931. According to this the Soviet fleet then consisted of 3 capital ships, 2 cruisers, 17 destroyers, 16 submarines, 6 mine-sweepers, 8 training ships, and a number of auxiliary vessels.

Reference is also made to "the vessels in the Black Sea taken by Wrangel to Bizerta." The latter include 1 capital ship, 1 light cruiser, 9 destroyers, and 4 submarines. If this statement is correct, 1 battleship, 4 cruisers, and 1 or 2 destroyers must have been removed from the effective list during the past couple of years, which compares oddly with the statement which appeared in the government controlled Soviet Press last year that the fleet had been increased by "nine large and many small units."

#### SWEDEN.

The Naval Estimates for 1931-32 amounted to Kr. 44,547,850 (about £2,447,600 gold). This represented a slight reduction on those of the previous year; but the sum voted for new construction was the same. Work on the hangar-cruiser Gotland did not proceed as rapidly as was originally intended, owing to the reduction of grants for shipbuilding, and it is now uncertain whether the vessel will be completed by 1934. The construction of two minelaying-submarines due to join the fleet in 1933 was also slowed down. On completion of the reconstruction of the coast defence ship Sverige, the Drottning Viktoria is being taken in hand. This work, too, is much behind time.

Four vedette boats are to be built in succession and should be ready for service in 1933. The first was laid down in March, 1932. These craft will be of 250 tons displacement with a length of 168 feet, and have a speed of 25 knots. The armament will be two 75 mm. guns. They are intended primarily as submarine chasers, but can also act as minesweepers. The submarine Bavern collided with the training cruiser Fylgia on July 27 and sustained damage to the upper works and periscope. She was reported to have sunk to a considerable depth, but was able to regain the surface by dropping a false keel. She subsequently returned to harbour under her own power.

#### TURKEY.

The destroyers Tinaz Tepe and Zafer laid down in Italy during the summer of 1930 have been completed and delivered to Turkey. They are similar in general design to Italian destroyers of corresponding date; the displacement is 1,600 tons, the armament four 4.7 and two 40 mm. A.A. guns, and six 21-inch torpedo tubes on triple mountings. The engines develop 35,000 H.P., and give a speed of 36 knots. In building these craft Turkey has not departed from the Turco-Greek and Turco-Soviet pacts entered into in 1930 and 1931 respectively.\*

#### YUGOSLAVIA.

The flotilla leader Dubrovnik, built for the Royal Yugoslav Navy at the Yarrow works on the Clyde, completed satisfactory trials early in 1932. It is of interest to note that while Britain, the United

\* See the "Annual" for 1932.

States and Japan have agreed not to build leaders of more than 1,850 tons or with guns exceeding 5·1-inch calibre, the Dubrovnik displaces, 2,400 tons and carries an armament of four 5·5-inch guns.

## SOUTH AMERICA.

### ARGENTINE.

With the delivery of the two cruisers *Almirante Brown* and *Venticinco de Mayo* at the end of 1931, and of the submarine *Sante Fe* early in 1932, the only warships building for the Argentine Navy were the two similar submarines, the *Salta* and *Santiago del Estero*. The need for economy and political difficulties made it impossible to proceed further with the somewhat ambitious programme of new construction approved by Parliament in 1926.

### BRAZIL.

On June 11, 1932, a decree was promulgated at Rio de Janeiro announcing the appropriation of £10,000,000, to be spread over twelve years, for the renewal of the Brazilian Navy. The existing fleet consists of 2 dreadnought type battleships completed in 1909–10, a coast defence ship of 1901, 2 light cruisers of 1909, 10 small Yarrow built destroyers of 1908–9, and 1 (*ex*-H.M.S. *Porpoise*) of 1913, and 4 submarines, only one of which is at all modern. An agreement was signed on June 25, 1932, between the United States Secretary of State and the Ambassador from Brazil at Washington providing for a naval mission composed of two commissioned officers and one chief petty officer of the United States Navy to assist the instructional staff of the Brazilian Naval War College.

### CHILE.

The Chilean Navy is slowly and painfully recovering from the effects of the mutiny of September, 1931. Much of the good work of the British Mission was undone by that unfortunate event which, while it was directly attributable to a reduction of pay, undoubtedly owed much to political, especially communist, intrigues. An appointment which created general satisfaction, and helped to promote a feeling of renewed confidence, was that of Rear-Admiral Edgardo von Schroeder as Commander-in-Chief, as it was felt to be a guarantee for restoring discipline. Admiral Schroeder hoisted his flag in the *O'Higgins* in September, 1932.

### PERU.

An outbreak of mutiny occurred on board the cruisers *Coronel Bolognesi* and *Almirante Grau* off Callao on May 7, 1932. It was believed to have had its origin in a communist agitation, and might have had more serious results but for the patriotism of a seaman belonging to the second ship, who swam ashore and gave the alarm.

The garrison of Lima was rushed to Callao to prevent the mutineers from landing, and a loyal submarine opened fire on the disaffected ships. As soon as the former began to hit, the mutineers surrendered. As the result of the subsequent court-martial, eight ringleaders were executed, fourteen seamen were sentenced to fifteen years' imprisonment and twelve to ten years. The seaman who gave the warning was specially rewarded.

## ASIATIC COUNTRIES.

## CHINA.

The sloop *Yat Sen* has been completed. She is a vessel of 1,650 tons displacement and carries one 6-inch and one 5.5-inch gun with anti-aircraft and smaller weapons. Her speed is 20 knots. One small cruiser is building at Shanghai, and another by contract in Japan.

## PERSIA.

The two small gunboats and four motor launches which were built at Naples to the order of the Persian Government were completed and left for Persia on September 17, 1932. They are intended for duty in the Gulf, and, as noted in last year's "Annual," the junior officers and crews have been trained in Italy. The senior officers will, at any rate to begin with, be Italian. The gunboats are vessels of 950 tons and carry an armament of two 4-inch and two 3-inch A.A. guns.

E. ALTHAM,  
Captain, C.B., R.N.

## CHAPTER III.

### COMPARATIVE NAVAL STRENGTH.

THE number of British war vessels of all types on the effective list at the beginning of 1932 was 364, which again showed a decline on that of the previous year. However much the advocates of internationalism may deplore the slow progress of armament limitations, it is a fact that the number of effective ships in the seven principal navies does show a perceptible diminution each year. The British total of 364 compares with 374 at the beginning of 1931, 377 in 1930, 379 in 1929, 387 in 1928, 424 in 1927, 444 in 1926, and 497 in 1925.\* The aggregate number of warships for all seven Powers also shows a decline during these years, but not to the same extent. The aggregate in 1932 was 1,741 vessels, of which the British total of 364 represented a little over 20 per cent. The aggregate in 1925 was 1,941 vessels, of which the British total of 497 represented over 25 per cent. The United States total of vessels declined during the seven years in question from 539 to 433. On the other hand, the totals of Japan, France, and Italy have increased—Japan from 211 to 253; France from 219 to 266; and Italy from 260 to 305. There is also an increase to be noted in the German total from 51 vessels to 68. While this method of “counting heads” is one which must always be employed with caution, since a battleship counts for no more than a coastal motor-boat, yet as a rough and ready indication of the trend of events from one year to another it is not without significance.

The extent of the decline in British naval strength, and of the lead which this country has given to disarmament, was put more clearly by the First Lord of the Admiralty, Sir Bolton Eyres-Monsell, in a speech in the House of Commons on November 30, 1932.† He said :—

The strength of the British Navy in comparison with the year before the War will have been reduced, by figures which we arrive at in 1936 by the London Naval Treaty, as follows :—Battleships from 69 to 15; cruisers from 108 to 50; destroyers from 285 to 117; submarines from 74 to 38. If we take tonnage, the total tonnage of our Fleet in 1914—I give round figures—was 2,160,000 tons. The tonnage in December 1936, will be 1,151,000 tons. If we compare that with the other great naval Powers we find that the total tonnage of the United States of America in 1914 was 881,000 tons. Under the London Naval Treaty the United States of America's tonnage at the end of 1936 may be 1,139,000. The total tonnage of Japan's Fleet in 1914 was 522,000 tons. Under the London Naval Treaty, Japan's tonnage at the

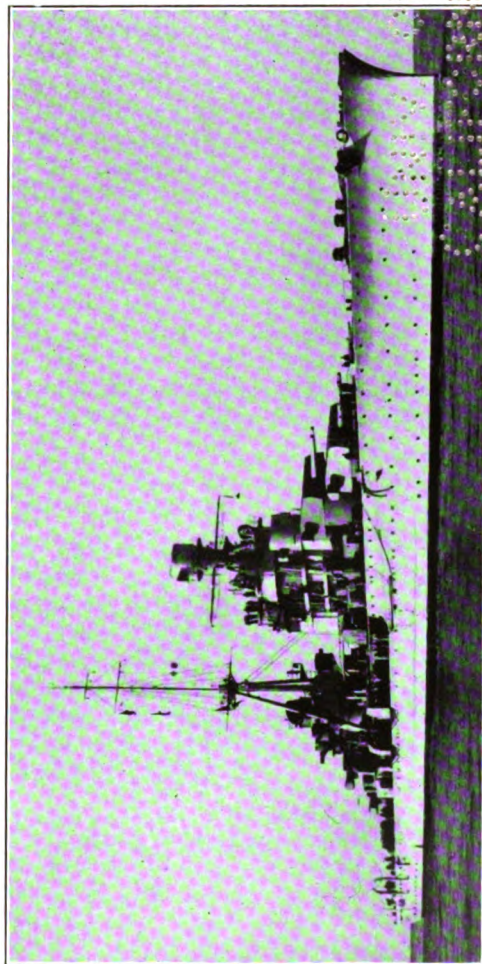
\* Figures extracted from the official Returns of Fleets, which show all battleships, battle cruisers, cruisers, cruiser minelayers, armoured coast defence vessels and monitors, aircraft carriers, flotilla leaders, destroyers, torpedo boats, submarines, sloops, coastal motor-boats, gunboats and dispatch vessels, river gunboats, and minesweepers of each Navy.

† “Hansard,” November 30, 1932 (886).





THE ITALIAN CRUISER DI GIUSSANO, 5,000 TONS.  
*Completed by the Ansaldo Company, 1931*



THE ITALIAN CRUISER ZARA, 10,000 TONS.  
*Completed by the Odero Terni Company, 1931.*  
*(Photos by courtesy of the Italian Ministry of Marine.)*



end of 1936 may be 720,000. It will thus be seen that by the end of 1936 the tonnage of the British Empire will have been decreased 47 per cent.; that of the United States of America may have been increased by 29 per cent.; and that of Japan by 37 per cent.

There was a somewhat ironical coincidence in the scaling down of the battleship fleets of Great Britain, the United States, and Japan under the London Treaty of 1930 at about the same time that competition was resumed in capital ships between France and Germany. The beginning of the Dunkerque, however, as a reply to the German "Deutschland" class, comes well within the limitations of the Washington Treaty, under which France and Italy have considerable margins of tonnage in which to build new ships. Each Power had the right to lay down a capital ship in 1927, and again in 1929, but neither took advantage of it. The beginning of a third German ship of the Deutschland type has now forced the hand of France, and if the construction of the Dunkerque goes on, it is bound to have its influence on all the other great Powers, sooner or later. The Dunkerque is expected to be of 26,500 tons. The British Admiralty is prepared to agree, under certain conditions, to a limit of 22,000 tons for battleships, according to a speech by the First Lord on November 30, 1932. The Board has no use for a 10,000-ton design, such as the Deutschland, believing that, for many technical reasons, it would produce a ship quite incapable of fulfilling the functions of a battleship.

#### FOREIGN CRUISER ACTIVITY.

Additions were made to their cruiser totals during 1932 by all the Powers represented at the Washington and London Conferences, except Great Britain. No new cruiser was passed into service for the Royal Navy; but the United States completed two, Japan four, France two, and Italy six. The British margin of cruiser strength, therefore, declined still further during the year. A more comprehensive survey of cruiser construction is to be obtained by perusing the following table of vessels of this class completed for the five principal Powers during the past twelve years:—

	Great Britain.	U.S.A.	Japan.	France.	Italy.
1921	2	—	4	—	—
1922	4	—	3	—	—
1923	—	6	3	—	—
1924	1	3	1	—	—
1925	1	1	3	—	—
1926	2	—	2	1	—
1927	—	—	2	2	—
1928	7	—	1	2	—
1929	4	1	3	—	2
1930	3	4	—	2	—
1931	1	3	—	2	4
1932	—	2	4	2	6
	25	20	26	11	12

After two years, during which she had not completed any cruisers, Japan made her position as second Power in this class of ship more secure in 1932 by the commissioning of the four vessels of the "Takao" class. These are the last 10,000-ton 8-in. gun cruisers which Japan has agreed to build up to 1936 under the London Treaty. No 8-in. gun cruiser has been laid down in Great Britain and Japan since 1928, but France and Italy, in 1931, and the United States, in 1931-32, continued to build vessels of this type. The cruisers added to the Italian Navy during 1932 established her more firmly as second naval Power in Europe in this class.

### BRITISH CRUISER STRENGTH.

At the end of 1932 there were fifty-one cruisers on the effective list of the British Fleet, including those of the Dominions, or one less than at the beginning of the year. The reduction to fifty cruisers offered at the London Conference has therefore been all but reached. The Centaur, completed in 1916, was scrapped during the year, and no new ship was passed into service. The total of fifty-one is made up as follows :—

"C" class, completed 1915-1922, 3,895-4,290 tons, four or five 6-inch guns	20
Brisbane and Adelaide (Australian Navy), 1916-1922, 5,120 tons, eight or nine 6-inch guns	2
"D" class, completed 1918-1922, 4,850 tons, six 6-inch guns	8
"E" class, completed 1926, 7,550-7,580 tons, seven 6-inch guns	2
"Hawkins" class, completed 1918-1925, 9,700-9,996 tons, six or seven 7.5-inch guns	4
"County" class, completed 1928-1930, 10,000 tons, eight 8-inch guns	13*
"B" class, completed 1930-1931, 8,400 tons, six 8-inch guns	2
Total	51

\* Includes 2 Australian Navy.

At the end of 1932, eight of the fifty-one British cruisers were over the age limit of sixteen years—the Comus, Castor, and Champion (completed 1915), and the Constance, Cambrian, Canterbury, Concord, and Brisbane (completed 1916). The United States has only one cruiser over age, the Rochester (1893, listed for disposal); and Japan only two, the Yahagi and Hirado (completed 1912). The proportion of old ships is heavier in the French and Italian Fleets. France has ten out of her twenty cruisers over age and Italy ten out of twenty-three. In both cases, the block of over-age tonnage is declining, and is being rapidly overtaken by new tonnage.

In the Royal Navy the proportion of obsolete cruisers will increase up to 1935, partly owing to the fact that only two ships, the Exeter and Leander, were laid down during the three years 1928-30, and partly owing to the delay in putting in hand the programmes authorised since the Naval Conference. On October 26, 1932, the First Lord, in announcing the placing of orders for the ships of the 1931 programme, said that the probable dates of completion for the three cruisers of this programme were in the spring of 1935. This means that no cruisers will probably join the Fleet

during 1934, during which year a further seven cruisers of War design pass their age limit. This is an evil not confined to one particular year. In each of the years 1931 to 1935 inclusive, far more cruisers have or will become obsolete than can be replaced by the new construction allowed for under existing programmes. The deficit amounts to no less than twenty-six vessels, or numerically one-half of our entire cruiser fleet, for while thirty-one cruisers of War design attain their age limit during the five years mentioned, only five new ships—the Exeter, Leander, Achilles, Neptune, and Orion—are available to replace them. The position may be made more clear by the following table:—

**CRUISER STRENGTH (AGE LIMIT 16 YEARS).**

Ships under age . . . . .	43
Ships over age . . . . .	8
Present total . . . . .	51 ships.

Year.	Due for Scrapping (Age Limit 16 Years).		Due for Completion.	Total left under 16 Years.
1933	Caradoc Caledon Curlew	Calypso Ceres Cardiff	Leander, authorised 1929 Achilles, authorised 1930	39
1934	Curacoa Carlisle Danae Dragon	Coventry Vindictive Dauntless	Neptune and Orion, authorised 1930	34
1935	Delhi Cairo Colombo	Dunedin Calcutta Hawkins	Amphion, Ajax, and Arethusa authorised 1931	31
1936	Effingham * Frobisher *		3 ships authorised 1932	32

\* Under the special provisions of the London Naval Treaty.

At the present rate of building, this country will need to retain on the effective list of cruisers in 1935 no less than nineteen cruisers of obsolete types even to make up a total of fifty ships, as the ships within the age limit in 1935 will number only thirty-one. This has been well described as disarmament by procrastination.

**CRUISERS OF OTHER POWERS.**

The cruiser list of the United States includes twenty-one vessels, a gain of one on last year, as although the Pittsburgh was scrapped, two of the 10,000-ton cruisers, the Portland and Indianapolis, were completed. When the old cruiser Rochester is disposed of, the United States cruiser fleet will consist entirely of post-War units, ten being 7,000-ton 6-in. vessels of the "Omaha" type, and the remainder 10,000-ton 8-in. vessels of post-Washington design.

The Japanese cruiser total was increased from twenty-seven to thirty-one by the passing into service of the four "Takaos" of 10,000 tons. All but two have been completed since the War, and are of 31 to 33 knots speed.

With the completion of the *Dupleix*, of 10,000 tons, and the training cruiser *Jeanne d'Arc*, France increased her total to twenty ships, as none was scrapped. The Italian output of cruisers was the largest of any country, including four 10,000-ton 8-in. gun ships and two 5,000-ton 6-in. gun ships. The rapidity with which Italy has restored her cruiser fleet is one of the most remarkable features of a review of comparative strength since the War. She laid down no cruisers at all during the years 1911-25, but has since begun the construction of seventeen, of which thirteen have been finished. Great Britain in the same period began the construction of fourteen (including two for Australia), of which ten have been finished; and the United States fifteen, of which ten have been finished.

The two factors which emerge from an analysis of the cruiser strength of the Powers are, first, the weakness of the "tail" of a score of British ships of small size and power built chiefly for North Sea service under the stress of war; and secondly, the activity which is being shown by Italy in restoring her position and implementing her claim to parity with France.

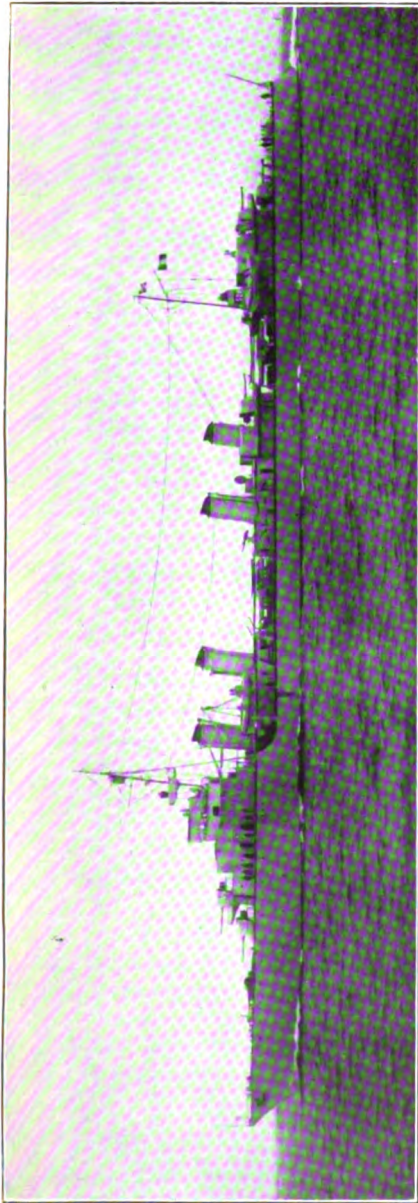
#### TREATY STRENGTH.

It is a pertinent question how far existing programmes will go towards providing the standard of strength approved in the London Treaty. On this point some useful figures were prepared by the United States Navy Department in June, 1932. They tended to show that the Japanese Navy will be nearest to Treaty strength by December, 1936. According to the American calculation,\* after making allowance for all tonnage building and appropriated for, the additional tonnage required to bring Japan up to Treaty strength amounts to 12,130 tons in aircraft carriers and 9,361 tons in destroyers; she will already attain, by past programmes, her tonnage quota in cruisers and submarines. Great Britain will be in the next nearest position to Treaty strength, reckoned in all classes of ships, but the United States will be nearest if cruisers only are considered. In aircraft carriers, Great Britain will stand in need of 19,650 tons to complete her quota, and the United States of 41,400 tons. In cruisers, Great Britain will need another 106,220 tons, and the United States 93,000 tons. In destroyers, Great Britain will need another 85,619 tons and the United States 134,500 tons; and in submarines, as compared with the British need of 11,491 tons, the United States will need 25,630 tons. Reckoning all types, Japan needs to provide another 21,491 tons, Great Britain 222,980 tons, and the United States 294,530 tons.

A significant feature about this American calculation was the light thrown upon the renunciation by Great Britain of her full

\* Figures prepared by United States Navy Department and made available for study by the Press, June, 1932.

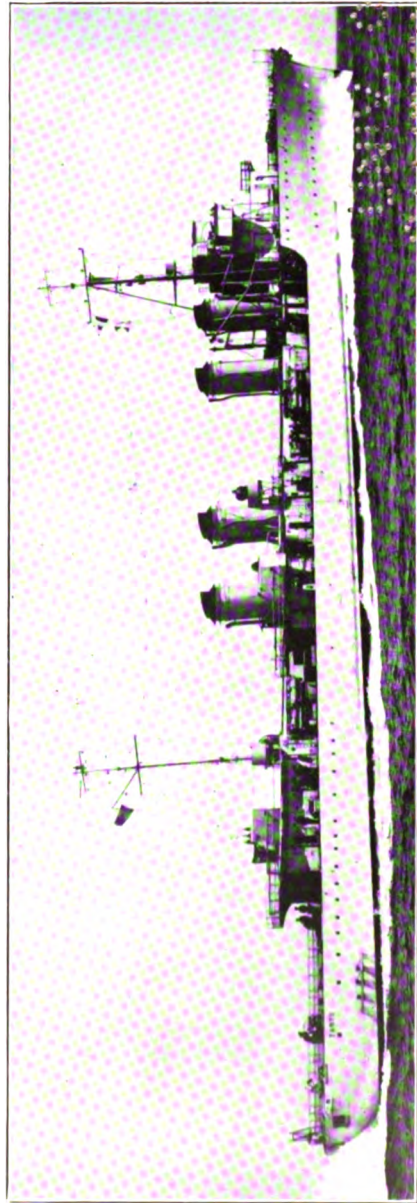




THE FRENCH FLOTILLA LEADER GERFAUT, 2,441 TONS, 40 KNOTS SPEED.

*(By courtesy of the French Ministry of Marine.)*

*Completed 1932.*



THE FRENCH FLOTILLA LEADER TARTU 2,441 TONS, 40 KNOTS SPEED.

*(By courtesy of the French Ministry of Marine.)*

*Completed 1932.*





Treaty rights in regard to cruiser construction. Under Article 20, the total replacement tonnage of cruisers to be completed by the British Commonwealth of Nations prior to December 31, 1936, shall not exceed 91,000 tons. The United States statistics show that towards this figure there are in hand four cruisers of 28,000 aggregate tons, and three more of 19,000 tons are appropriated for, leaving only 44,000 tons which can be put in hand to reach the special figure of 91,000 tons. But actually, when the 28,000 and 19,000 tons are completed, the strength in cruisers will be 106,220 tons short of that allowed by Treaty, so that by limiting ourselves to 91,000 tons of new building up to 1936 we have foregone the right to build 62,220 tons of ships. No such renunciation was made by any other Power at the Conference. The deficiency will, of course, need to be made up for a time—so far as it can be—by retaining on the list ships ineffective by reason of age and later improvements in design, armament, and protection.

The naval forces of the Soviet Union still include five battleships and eight cruisers, but the number of submarines has risen from nineteen to twenty-two. So far, the organisation of the Soviet as regards naval defence has not included any important measure of shipbuilding. A feature of the world's warship construction, however, is the number of units in hand for the lesser naval Powers, some of which are also training up an efficient personnel, partly by the use of sailing vessels in long oversea cruises.

#### SLOOPs FOR POLICE DUTIES.

The tendency to include the sloop of the British Navy, which are so largely used overseas, in comparisons of cruiser strength is a dangerous one. These ships have no fighting power, any more than the little Pegasus had against the Konigsberg at Zanzibar. In this connection, the appearance of superior designs of sloop abroad should be noted. Whereas we are duplicating the "Shoreham" type of 1,105 tons, armed with two 4-in. guns, the French began in 1929-1930 the "Bougainville" class, of 1,968 tons, armed with three 5.1-in. guns.

A class of vessel in which France and Italy have the monopoly is coastal motor-boats. The last six British coastal motor-boats were scrapped in 1930, but France still has three and Italy forty vessels of this class. France has ten more building, each to carry two torpedoes; and Italy three, each to carry a small gun and two torpedoes.

#### TORPEDO CRAFT.

The totals of flotilla leaders and destroyers of the Powers remain much the same as last year, but a mere comparison of figures does not indicate the accession of strength to the French and Italian fleets by the completion of large, fast, and heavily armed vessels in these classes. Two of the French flotilla leaders tried during 1932, the Gerfaut and the Cassard, each of 2,441 tons displacement and

armed with five 5·5-in. guns, reached 43 knots, which was claimed as a world record. These vessels, of which thirty have been begun by France during the past ten years, are of a type which, if built by Great Britain, the United States, or Japan, would have to be deducted from the cruiser tonnage allowance.

More remarkable is the activity in submarine construction in the French and Italian yards. In the five years 1927-31 inclusive, France put in hand a volume of submarine tonnage equal to the whole of the British strength in this class—fifty-four units, including among them the largest submarine in the world, the *Surcouf*, of 2,800 tons and armed with two 8-in. guns and fourteen tubes. Italy during the same period began the construction of forty-one submarines. At the close of 1932 the two Powers had in hand twenty-six and twenty-nine submarines respectively. Whereas France and Italy have been building submarines at the rate of ten vessels and eight vessels a year, the British programmes have provided for only three submarines a year. There is no object to be gained in emphasising this comparison, since in the ordinary way submarines do not fight submarines. Where one would expect to find a reaction to these high submarine programmes is in British destroyer building, but it is not apparent. Not more than one flotilla (one leader and eight destroyers) has been sanctioned in any one year since the resumption of building for replacement purposes was approved in 1927.

Another point of importance in connection with the decline in the British destroyer flotillas owing to the retention of so many semi-obsolete vessels is the extension of submarine construction to several minor Powers. About a hundred submarines have been built since the War by the minor Powers of Europe, some of whom never possessed submarines at all before. The following is a list:—

Finland . . .	4 (1930)	Sweden . . .	12 (1920-30)
Latvia . . .	2 (1927)	Norway . . .	6 (1922-29)
Poland . . .	3 (1931)	Netherlands .	30 (1919-32)
Rumania . . .	1 (1932)	Greece . . .	6 (1926-28)
Turkey . . .	4 (1927-31)	Portugal . . .	3 (1933)
Yugoslavia . .	4 (1928-9)	Spain . . .	12 (1921-29)
Denmark . . .	2 (1926)	Soviet Union (?)	11 (1922-32)

It is a curious fact that the Netherlands have got more post-War submarines than Germany possessed up to the spring of 1915.

#### AIRCRAFT CARRIERS.

There is a definite check to be observed in the development of aircraft carriers. No new ships of this category were begun during 1932, and the three which are in hand from previous years—the United States *Ranger*, the Japanese *Ryujo*, and the French *Commandant Teste* (aviation transport)—are of much less tonnage (7,600 to 13,800) than the large carriers fitted out immediately after the Washington Conference, of which the heaviest are the *Lexingtons* in the United States Navy, with a displacement of 33,000 tons each.

No new carriers are projected, but in the meantime increased facilities are being provided in new cruiser designs for the carriage of aircraft.

#### AIRCRAFT STRENGTH.

Precise information regarding the numbers of naval aircraft belonging to the various Powers is difficult to obtain, owing partly to the interchangeability of types between land and sea service, and partly to the fact that in countries where there is a separate air force the allocation of machines between the respective arms is not always clearly defined. As regards the strength of the Powers in aircraft of all kinds for military purposes, the following table is compiled from the "Particulars with regard to the position of Armaments in the various countries," supplied to the League of Nations by the Governments who took part in the Disarmament Conference of 1932 :—

	First-line Aircraft.	Total, with all reserves.
France . . . . .	1,687	3,000
U.S.A. . . . .	1,752	2,351
Japan. . . . .	1,384	1,939
Italy . . . . .	—	1,507
Great Britain . . . . .	706	1,434
Yugoslavia . . . . .	627	924
Rumania . . . . .	599	799
Poland . . . . .	—	700
Czechoslovakia . . . . .	546	687
Spain . . . . .	462	649

When introducing the Air Estimates on March 17, 1931, Mr. F. Montague, M.P., then Under-Secretary of State for Air, said : "It is a fact, however, that this country stands fifth, as regards first line strength, among the Air Powers of the world. Moreover, in our case, our smaller strength is much more widely distributed and has to bear a much bigger responsibility for air defence abroad."

In the United States, the aeroplanes of the Navy were reduced, for reasons of economy, from 1,000 to 965 in 1932. In the British Fleet Air Arm there are twenty-four flights, and the normal number of aircraft per flight is six, giving a total of 144 machines. These are the only aircraft under regular Admiralty control. The units under R.A.F. control, which are available for naval co-operation and training, include seven flying boat squadrons, four at home and one each at Malta, Basra, and Singapore, with an aggregate of twenty-nine aircraft; two torpedo bomber squadrons for coast defence, one at Donibristle and one at Singapore, aggregating twenty-four aircraft; and various training flights for the Fleet Air Arm, at Leuchars, Gosport, Lee-on-Solent, and Calshot, aggregating sixty-five aircraft. Even if all these machines are added to the total of the Fleet Air Arm proper, making a grand total of 262 aircraft, this is not much more than one-fourth of the United States total.

## PERSONNEL OF THE POWERS.

Bearing in mind that the most important element of naval strength in the last resort is personnel, the reductions in the total of officers and men of the British Navy, unaccompanied by similar reductions in other fleets, cannot be regarded as otherwise than serious. Answers in Parliament in February, 1932, gave the following figures for active service personnel:—Italy, 51,000; France, 58,050, plus about 3,150 port seamen and retired men, but excluding about 5,250 Air Service personnel; Japan, 80,000; Great Britain, 91,410; United States, 107,000. The last-named figure does not include 11,866 professional man-of-war's men employed in the United States Coastguard and Revenue Services. A comparison of the figures regarding naval reserves also reveals the extent of British weakness. The number of naval reserves in the United States of America on June 30, 1931, was 42,508. The Japanese naval reserves number about 50,000. The British reserves total 33,806, made up of 9,105 in the Royal Naval Reserve (merchant officers, seamen, fishermen, etc.); 20,137 in the Royal Fleet Reserve (time-expired seamen and stokers); and 4,564 in the Royal Naval Volunteer Reserve (civilians, yachtsmen, and the like).

It is a remarkable fact that this question of personnel is outside the scope of any treaty. Speaking in the House of Commons on November 30, 1932, the First Lord admitted, very frankly, that he was apprehensive and worried about the number of men in the Royal Navy. The worst trouble which must, he said, be corrected, was that of having too few men. He spoke of the manner in which the "pool" of spares for courses, leave, sickness, and crossing relief crews had been raided by successive economy committees until it had been cut down a great deal too much. "The result of that, although it may sound a small thing, to my mind is the most serious thing in the Navy," he added. "I am afraid the only real solution is an increase in Fleet numbers." The importance attached to this question and its relationship to the efficiency of the Fleet is the best indication yet given that the Royal Navy has been weakened too much by one-sided disarmament.

G. H. HURFORD.

## CHAPTER IV.

### THE DISARMAMENT CONFERENCE, 1932.

*. . . and heard great argument  
About it and about, but evermore  
Came out by the same door as in I went.*

Fitzgerald's "Rubáiyát."

THE delegates of the much heralded Disarmament Conference assembled at Geneva in February, 1932, under auspices not too favourable, for a situation of gravity had arisen in the Far East and war clouds were lowering over China and Japan. The Conference was opened by Mr. Arthur Henderson on February 2. In his address he pointed out that its object was to arrive at a collective agreement on an effective programme of practical proposals speedily to secure a substantial reduction and limitation of all national armaments.\* Behind them stood the five years' work of the Preparatory Commission appointed in 1925, which had put forward a draft convention for the limitation and reduction of armaments, waiting only for the figures to be filled in.

"Are we ready," said Mr. Henderson, "to shape our policy with a faith that war is done with, that we have genuinely renounced war as an instrument of national policy?"

Apparently the world was not quite ready for this consummation, for on February 5, M. Tardieu stated that he wished to respond to Mr. Henderson's appeal by making a positive contribution to the work of the Conference. Briefly, this contribution consisted in the proposal to arm the League with an International Force for the maintenance of peace.

The French proposals fell under four heads:—

(1) In the case of air forces, all heavy bombing planes to be handed over unconditionally to the League of Nations; (1a) all machines of medium strength to be held at the disposal of the League; (2) heavy land artillery, capital ships over 10,000 tons, or with guns of over 8 inch, and large submarines, to be retained only by those nations ready to place them at the disposal of the League; (3) creation of an International Police Force; (4) political measures including the acceptance of compulsory arbitration, the definition of aggression and precise guarantees of common actions against a Covenant breaker.

For the International Force France was prepared to offer—for areas outside Europe—a mixed brigade, a naval division, and a group of aircraft; for areas in Europe, one army division, one naval division, and a mixed group of aircraft. Precisely how the contribution of a single army division to the League was going to ensure the peace of Europe was not explained. These proposals might be magnificent, but they made no direct contributions to the cause of

\* *The Times*, Feb. 3, 1932.

disarmament. To some they were patently impracticable \* and were to be regarded merely as the diplomatic assertion of a fixed determination that disarmament should not take precedence of armed security.

On February 8, Sir John Simon presented the proposals of the British Government :—

Great Britain (1) accepted the Draft Convention as a basis of discussion ; (2) accepted, too, the proposal for the establishment of a Permanent Disarmament Commission ; (3) urged the abolition of gas † and chemical warfare ; (4) pressed for the abolition of submarines ; (5) would seek to find a practicable course for limiting the number of effectives ; (6) suggested special attention be directed towards the prohibition or a limitation of such armaments as would weaken attack ; (7) would be ready to co-operate in every method of agreed reduction in the size of ships and of maximum gun calibre.

In the limitation of armaments Great Britain advocated the method of fixing maximum limits and of excluding certain instruments of war, but “ the practicable application of a system of agreed limitations undoubtedly involved the establishment of a fair datum line.” ‡

The next day (February 9), Mr. Hugh Gibson presented nine points on behalf of the United States. He pointed out that the Conference at Washington of 1922 had made the first concrete contribution to voluntary limitation. The system of competitive armament by alliances and cross alliance had failed to maintain peace in Europe and seemed indeed to be provocative of war. Yet every nation required an adequate military force, first for internal police work, and secondly to defend its national territory against aggression and invasion.

Since practically all the nations of the world had pledged themselves not to wage aggressive war, the United States Government believed that the Conference should, and could, successfully devote itself to the abolition of those weapons which were devoted primarily to aggressive war, and they were prepared to give earnest and sympathetic consideration to any plans seeming to furnish a practicable and sound basis for a general limitation and reduction of armaments. Mr. Gibson then formulated his nine points :—

(1) Consideration of the Draft Convention ; (2) prolongation of Washington (1922) and London (1930) Agreements, completing the latter by the adherence of France and Italy ; (3) proportional reduction of the figures of naval tonnage laid down in the two agreements as soon as all parties to the Washington agreement have entered its framework ; (4) total abolition of submarines ; (5) protection of civilian population against aerial bombing ; (6) total abolition of lethal gases and bacteriological warfare ; (7) computation of armed force strength on the basis of effectives necessary for maintenance of internal order, plus some suitable contingent of defence ; (8) special restrictions for tanks and mobile guns, for those arms of a “ peculiarly offensive character ” ; (9) the United States was prepared to consider a limitation of expenditure on material as a complementary method of direct limitation, feeling that it might prove useful to prevent a qualitative race, if and when quantitative limitations have been made effective.§

\* M. Léon Blum pointed out that the scheme is worthless because there is to be no reduction of armaments until it is adopted, and it cannot be adopted till various impossible conditions have been realised.—*The Times*, February 10.

† Gas has already been prohibited by the Protocol of 1925.

‡ League of Nations Conference, D/P. V 1 (1).

§ *The Times*, February 10.





THE U.S. SUBMARINE NAUTILUS (V6), 2,730 TONS.

*Completed 1930.*

*(By courtesy of the U. S. Navy Department.)*

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On February 10 Signor Grandi presented the Italian proposals, which were simple, clear, and concrete. Italy was ready to accept the abolition of capital ships and submarines, of heavy land artillery and bombing aircraft. The task of the Conference was "to fortify justice, not to justify force." The guiding principle of the Italian delegation, in Signor Mussolini's words, was equality of rights between all States and the equalisation of armaments at the lowest level. Italy was ready to do everything in her power to bring about a naval agreement with France.\*

Mr. Matsudaira followed for Japan with the following proposals :—

(1) Acceptance of the Draft Convention as a basis of discussion; (2) limitation of use of submarines; (3) reduction of size of battleships and of calibre of guns; (4) reduction in tonnage of aircraft carriers; (5) abolition of bombardment from air.

Germany, represented by Herr Nadolny, in the absence of Dr. Brüning, put forward two main propositions :—

(1) The suppression of weapons of offence, and the general limitation of armaments. Weapons of offence were to include all mobile guns of over 3-inch, all mobile howitzers over 105 mm. (4-inch), and tanks; (2) military aviation was to be prohibited, and fortifications constituting a direct menace to other nations; (3) she also agreed to the prohibition of poison gas; (4) would abolish compulsory service and reduce and limit authorised armaments by laying down maximum figures; (5) on the naval side she was prepared to agree to the abolition of capital ships, aircraft carriers, and submarines. She proposed also that no vessel of war should in future exceed 10,000 tons or carry guns of over 280 mm. (11-inch).†

These proposals, following, more or less, closely the principles of disarmament imposed on Germany at Versailles, presented from the German point of view a not unreasonable basis for discussion. The various proposals may be summarised in the following table :—

	Fr.	G.B.	Germ.	Ital.	Jap.	Russ.	Spain	U.S.A.
Draft Convention as basis	—	X	—	—	X	—	—	X
Permanent Disarmament	—	X	—	—	—	—	—	—
Comm. . . . .	Xa	Xa	XA	XA	XA	XA	XA	XA
Chemical Warfare . . .	XL	Xb	—	XA	XA	XA	—	Xc
Bombing Aircraft . . .	XL	—	XA	XA	—	—	XA	—
Military aviation . . .	XL	XA	XA	XA	—	XA	XA	Xd
Heavy land guns . . .	—	—	XA	XA	—	XA	XA	Xd
Tanks . . . . .	—	—	—	—	X	—	—	—
Limitation and reduction	—	X	—	—	—	—	—	—
of armaments . . . . .	X	—	—	—	—	—	—	—
Effectives, limitation of	—	—	—	—	—	—	—	—
International Police Force	—	—	—	—	—	—	—	X
Naval tonnage reduction	XL	Xe	—	XA	Xe	XA	XA	—
Capital ships . . . . .	XL	XA	—	XA	Xf	XA	—	XA
Submarines . . . . .	—	—	—	XA	Xe	XA	—	—
Aircraft carriers . . . .	—	Xe	Xe	—	Xe	—	—	—
Naval guns, reduction in	—	—	—	—	—	—	—	—
size . . . . .	—	—	—	—	—	—	—	X
Washington and London	—	—	—	—	—	—	—	—
Treaties, Prolongation of	—	—	—	—	—	—	—	—

A—Total abolition.

a—By special agreement.

b—Examination of whole problem.

c—Protection of civilians from.

d—Special restrictions.

L—To be held at disposal of League of Nations.

e—Reduction in size.

f—Limitation of use of submarines as in London Treaty.

\* *The Times*, February 10.

† *The Times*, February 10.

It will be seen that France did not favour any concrete measure of disarmament. To her disarmament is only possible in a world organised for peace on a basis of collective security. France from a juridical point of view takes her stand on the interpretation she places on the Covenant and, considering the circumstances under which she signed it, her attitude is logical enough, though it involves a complete deadlock. From a British point of view progress along the lines of collective security may be ruled out, for we have already assumed obligations as heavy as we can bear in that direction; our Navy has already been reduced to the lowest margin of safety, and it may well be doubted how far, and in what direction, further disarmament can go.

Two currents of opinion were quickly discernible in the Conference. On the one side is the French view with Poland, Jugo-slavia, and Finland supporting France, seeking to give the League executive power and to saddle all nations with the obligation of enforcing peace. On the other hand were ranged the Anglo-American-Italian proposals asking for a measure of direct disarmament and the abolition of such weapons as may be regarded as primarily aggressive.

Much discussion followed as to what armaments may be regarded as most specifically offensive. Here the Conference made little headway. Offence and defence are subjective terms dependent on circumstances, applicable to agents but not to the instruments of agency. A shield is in its essence a typically defensive weapon, but if it is taken up and hurled at a foe it becomes extremely offensive. A rock is usually regarded as a means of defence, but when Hector hurled a "nubbly one" at Ajax the latter probably regarded the action as extremely offensive. Again, tanks are usually regarded as an embodiment of offensive potency, but to our hard-pressed soldiers behind them they appeared as shields brought from an ultimate armoury in dire defensive need with the task of defending French soil from further aggression. Again, battleships are regarded by some as primarily offensive, but their actual task in the Great War was to defend and guard the seas.

The fact is that a weapon is defensive when used defensively and under circumstances of defence, and offensive when used offensively. Nor does the special potency of a weapon necessarily relegate it to a category of offence. A bombing aeroplane seems to be offensive, but if used to bomb an invader landing on one's shores is definitely defensive in its use.

On May 4 an important address was given by the First Lord of the Admiralty (Sir Bolton Eyres-Monsell) in the Naval Committee of the Conference. He was unable to agree with the views of the Italian, Soviet, and German delegations that the aircraft carrier was designed primarily to carry bombing aeroplanes. Large bombing machines could not be accommodated on board them and the number of carriers was limited. Great Britain, however, was prepared to reduce their size. With regard to the submarine Sir Bolton Eyres-Monsell pointed out that it was a weapon particularly susceptible to abuse; its existence enforced on all navies higher

requirements for destroyers and anti-submarine craft, and its abolition would lead to lower levels in the destroyer category. The British delegation believed that a small submarine of a standard displacement of 250 tons on the surface would meet all requirements of defence and was prepared to support a reduction to a maximum size of 250 tons.\*

The British opinion of the aggressive character of the submarine was opposed, however, by the French delegation, who reiterated the opinion that the submarine was pre-eminently defensive in character. France had been accorded at the Washington Conference a tonnage of capital ships insufficient for defence, and had therefore been obliged to resort to the construction of submarines.†

It was given to the Naval Committee :—

To determine the degree of offensive character possessed by different types of war vessels, and more particularly those which were (1) most specifically offensive; (2) most efficacious against national defence, and (3) most threatening to civilians.

They could only find that “nearly all naval weapons possessed to some extent both an offensive and defensive character at the same time,” the character varying according to the circumstances of the different countries. The examination was confined, however, to capital ships, aircraft carriers, submarines, and mines, so that it may be assumed that cruisers and destroyers were regarded as vessels specially necessary for defence.

On May 27 the Naval Committee adopted the report of its sub-committee, which disclosed distinct divergencies of view. On the character of capital ships the United States, Great Britain, and Japan expressed the view that though they possessed fighting qualities superior to other types of vessels they were not specifically offensive nor the most efficacious against national defence nor the most menacing to a civil population.‡

The Italian delegation took the opposite view. Argentina, Bulgaria, and a number of the lesser naval Powers, interpreting size and power as in their nature offensive, considered that the larger the ship is, the more specifically offensive and the more efficacious against national defences she becomes, but precisely how H.M.S. Nelson or H.M.S. Hood could get up the Tagus, the Scheldt, the Weser, or the Yang-tse-Kiang, was not stated. Argentine, France, and Poland regarded all “capital ships” as coming within the three categories mentioned “whenever a State adopts a policy of aggression.”

With regard to aircraft carriers, Argentina, Great Britain, and the United States considered them more vulnerable than any other type of vessel and not able of themselves to be utilised for offensive purposes. The French did not regard them as included in the categories mentioned, whereas Germany, Italy, the Soviet and Japan did. With regard to the submarine, Argentina and Great Britain regarded it as “most threatening to civilians,” and the United States and Japan considered that it came under the three

\* This would be about the size of the early British “B” boats (1905).

† *The Times*, May 5.

‡ *The Times*, May 28, 1932.

categories. On the other hand France, Spain, Italy, and Poland held that it possessed at the same time the character of an offensive and a defensive arm, particularly qualified for defensive duties of patrolling and protection and could not be reproached with being inhuman to non-combatants. It constituted in their opinion the best defence of small and medium navies. Italy considered that its offensive character would become preponderant if capital ships did not exist.\*

On this question of "capital" ships or more simply "battleships" there are divergent views. One distinguished flag officer puts the question: "Why do you need a ship of more than 10,000 tons?" The answer must be sought in another question: "What would we have done in 1914 if we had had nothing bigger than the Monmouth (which was sunk at Coronel)?" Size in fact means power, and where there is a striving after superiority in power there is bound to be a competition in size. No doubt if the element of competition and the idea of superiority in battle could be eliminated the battleship might be reduced to 10,000 tons or indeed to almost anything that would keep the sea, but the idea of superiority in battle will only disappear when the idea of battle disappears. There are, of course, limitations to the size of a battleship—limitations of economy and limitations imposed by the size of docks—but the fact remains that, so far as the individual ship is concerned, size means power, and there are grave objections to reducing our battleships to a displacement so low as 10,000 tons.

On May 31 the Naval Committee resumed its examination of the Draft Convention and pronounced itself in favour of fixing the age limit of capital ships at 26 years, that of aircraft carriers at 20 years, of surface vessels not exceeding 3,000 tons at 12 to 16 years, and of submarines at 13 years.

#### PRESIDENT HOOVER'S PROPOSAL.

The Conference was still busy with these discussions when on June 22 Mr. Hoover launched very definite proposals based on certain principles. The principles enumerated were:—

(1) The existence of the Kellogg-Briand Pact; (2) reduction to be accomplished by broad general cuts in armaments and not merely by increasing the comparative power of defence through a decrease in the power of attack; (3) preservation of relativity in such reduction; (4) reduction to be real and positive affording economic relief; (5) Land, Air and Naval forces to be regarded as all inter-connected and not to be disassociated.

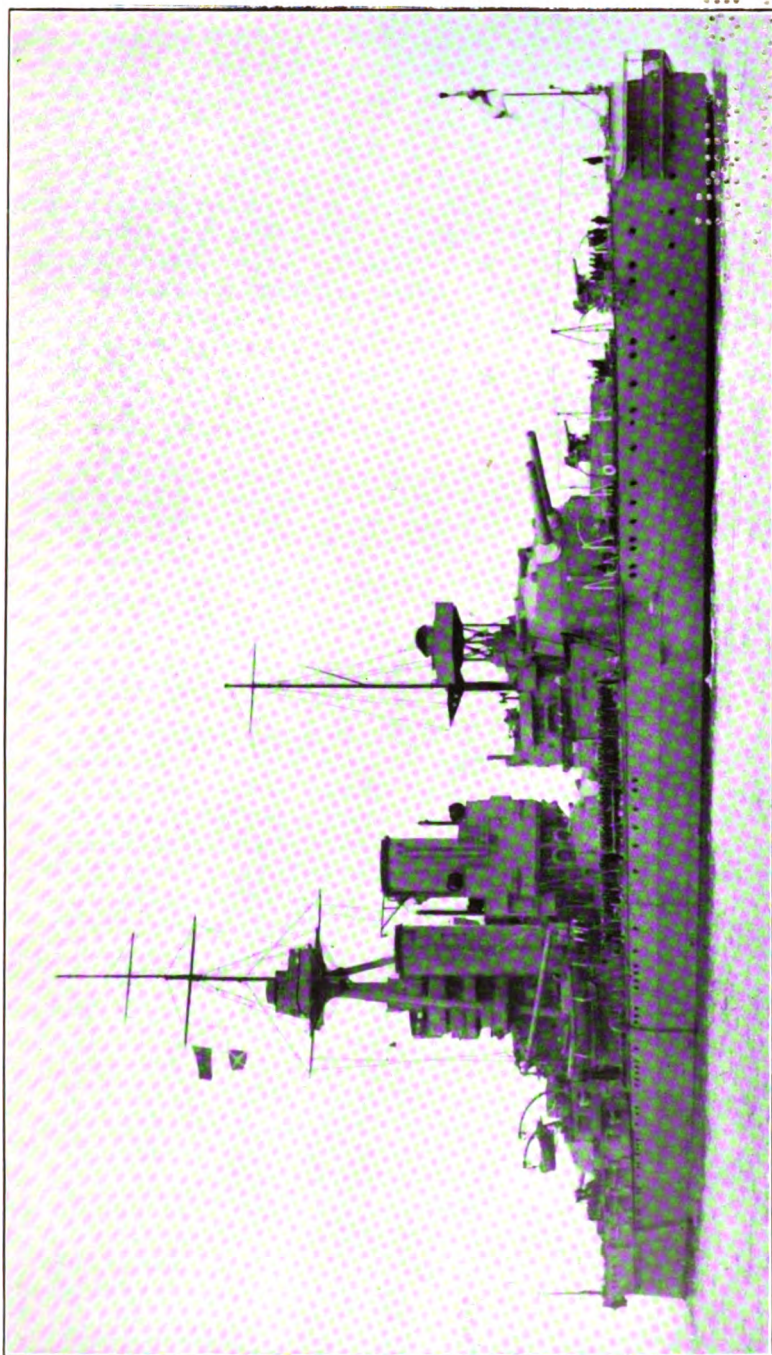
On the basis of the above principles Mr. Hoover presented the following proposals:—

(a) Abolition of tanks, chemical warfare and all large mobile guns; (b) reductions of all land armies by one-third; (c) abolition of all bombing planes; (d) treaty number and tonnage of battleships to be reduced by one-third; treaty tonnage and number of cruisers by one-fourth, of submarines by one-third, and no nation to have more than 35,000 tons tonnage of submarine; (e) the French and Italian strength in cruisers and destroyers to be calculated as though they had joined the Treaty of London (1930) on the basis of the accord of March, 1931.

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\* *The Times*, May 28.





(Photo by Stephen Cribb, Southsea.)

**H.M.S. IRON DUKE, GUNNERY FIRING SHIP.**  
*Recommissioned after reconstruction, October 4, 1932.*





These proposals cut right across the deliberations of the Conference: teeming with technical difficulties and too drastic for general consumption, they could hardly hope for immediate acceptance.

Mr. Baldwin on July 7 made an announcement of the British policy.\* President Hoover's proposal was welcomed alike because it called for a really substantial measure of disarmament and because it sought to apply the two principles of quantitative and of qualitative limitation. The British Government were in agreement with President Hoover on the principle that the three problems of Military, Naval, and Air Disarmament were inter-connected and that international agreement could not be attained without an adequate contribution from all three sources. The contribution that concerned Great Britain most was the naval one, in which sphere contributions had already been made to disarmament on the largest scale.† But they were prepared to do still more and to offer certain proposals covering all types of vessels. These were:—

(1) To reduce the maximum size of any future capital ship from 35,000 tons and 16-inch guns to 22,000 tons and the maximum calibre of guns carried to 11 inches; (2) reduce the maximum size of cruisers hereafter constructed from 10,000 tons and 8-inch guns to 7,000 tons and maximum calibre of guns to 6·1 inches; (3) if international agreement on (2) could not be reached, yet they would still urge that the maximum size of capital ships be reduced to 25,000 tons and their guns to 12 inches as a maximum; (4) reduce the maxima for aircraft carriers from 27,000 tons to 22,000 tons with 6·1 inch guns; (5) abolish submarines; (6) reduce destroyer tonnage by approximately one-third, this depending on the abolition of submarines; (7) if submarines could not be completely abolished, fix their maximum tonnage at 250 tons with a strict limitation both of total tonnage and number of units.

In the military and air sphere, the British Government proposed to abolish chemical and bacteriological warfare; all mobile guns over 6·1 inches; tanks over 20 tons which were specially suitable for offensive employment; complete prohibition of bombing from the air save within limits to be precisely laid down; strict limitation in unladen weight of all military and naval aircraft; a restriction in the numbers of all kinds of military and naval aircraft.

It will be generally admitted that so far as Great Britain is concerned these far-reaching proposals touch the rock bottom of naval disarmament and have even given rise to considerable anxiety in the minds of close students of naval affairs. The Navy remains for Great Britain the principal arm of defence for our maritime trade and oversea dominions, and these proposals mean an ultimate reduction in capital ship tonnage alone of 195,000 tons, some 20,000 tons more than the one-third reduction which Mr. President Hoover asked for. No doubt if we lived in a world that had put war out of its mind, big reductions on this scale might be viewed with equanimity, but in this very year there is an attitude, if not a state of war, fully discernible from China to Peru inclusive of Bolivia and Paraguay. We may dream of universal peace but its actuality in this world seems far away.

\* *The Times*, July 8; see also Declaration of British Disarmament Policy, Cmd. 4122.

† That is more particularly in the Washington (1922) and London (1930) Treaties.

## THE BENES RESOLUTION.\*

We come now to the Resolution on July 21, put by Dr. Benes. In it the Conference did little more than set down the principles by which it had "decided to be guided," and "decided to record" certain conclusions and concrete measures "which should form part of the General Convention," without by any means coming to any final decision or conclusive agreement with regard to any of them. The Resolution opens with an impressive flourish.

Profoundly convinced that the time has come when all nations of the world must adopt substantial and comprehensive measures of disarmament; firmly determined to achieve a first decisive step, involving a substantial reduction of armaments; welcoming heartily the initiative taken by the President of the United States, the Conference decides forthwith and unanimously to be guided by the general principles underlying President Hoover's declaration:—

- (1) That a substantial reduction of world armaments shall be effected, to be applied by a general Convention alike to land, naval, and air armaments.
- (2) That a primary object shall be to reduce the means of attack.

The Resolution then goes on in Part II to say that the Conference "decides without prejudice to more far-reaching agreements hereafter to record forthwith the following concrete measures of disarmament" which should form part of the General Convention to be concluded, and "decides to establish certain principles as the basis for further reduction." With regard to (1) Air Force, the Conference "records at this stage" the following conclusions:—

- (i) Air attack against civilian population shall be absolutely prohibited. (ii) High Contracting Parties shall agree as between themselves † that all bombardment from the air shall be abolished, subject to agreement with regard to measures to be adopted for the purpose of rendering effective the observance of this rule. These measures should include the following:
  - (a) There shall be effected a limitation by number and a restriction by characteristics of military aircraft.
  - (b) Civil aircraft shall be submitted to regulation (*réglementation*) and full publicity. Civil aircraft not conforming to the specified limitations shall be subjected to an international régime (except for certain regions where such a régime is not suitable), such as to prevent effectively the misuse (*emploi illicite*) of such civil aircraft.

With regard to (2) Land Armaments:—

(a) Land Artillery. All heavy land artillery of calibres between any maximum limit, as determined in the succeeding paragraph, and a lower limit to be defined shall be limited in number.

The limitation of calibre of land artillery shall be fixed by the Convention. Subject to an effective method being established to prevent the rapid transformation of guns on fixed mountings into mobile guns, different maxima for the calibre of land guns may be fixed as follows: (a) A maximum limit for the calibre of coastal guns, which shall not be less than the maximum calibre of naval guns; (b) a maximum limit for the calibre of guns in permanent frontiers or fortress defence systems; (c) a maximum limit for the calibre of mobile land guns (other than guns employed for coastal defence).

(b) Tanks—the maximum unit tonnage of tanks shall be limited.

(3) Chemical, Bacteriological, and Incendiary warfare shall be prohibited.

(4) There shall be set up a Permanent Armaments Commission to enable the Convention to be effectively applied.

\* Conference D/C. G. 31, presented by Dr. Benes, printed in the *Journal* (L. of N.) July 21, 1932.

† French "s'engageront à abolir entre elles tout bombardement aérien," literally "to abolish between themselves." The sense of the English version seems somewhat different, for "between themselves" is attached to "agree."

Part III makes preparations for the next phase of the Conference. The Bureau is to continue at work examining the questions of:—

- (1) Limitation of effectives. (2) Limitation of national defence expenditure. (3) Trade in and manufacture of arms. (4) Naval armaments.

The Conference invites the Powers Parties to the Naval Treaties which have already produced important results to confer together and report on further measures of naval reduction which might be feasible. Attached to the Resolution was a long commentary by Dr. Benes, the "rapporteur," who explained that it signified the definite adoption of the principle of qualitative disarmament and particularly those that were most effective and dangerous, viz. aviation, heavy land and naval \* artillery, and tanks.

On July 21 the Conference discussed the draft. Signor Grandi was no longer there. He was suddenly succeeded in his place as head of the Italian delegation by General Balbo, who flew that day from Rome to Genoa to state that "a declaration of goodwill was not sufficient, for the world expected concrete and definite conclusions. . . ." Italy was "compelled to declare that the effort accomplished had been vain and far below the hopes of the world." Mr. Litvinov, the Soviet delegate, proposed an amendment on the lines of President Hoover's proposals, but the text of the Resolution was maintained † by 30 votes to 5, with 16 abstentions.

The Soviet delegation put another amendment in favour of complete prohibition of all aerial bombing and the total abolition of bombing aircraft, and again the text of the Resolution was maintained.

The Resolution was adopted finally on July 23 by 41 votes to 2, with 8 abstentions. Germany and the Soviet voted against the Resolution, after Count Nadolny (Germany) had announced that his Government must oppose it on the grounds that it did not give Germany juridical equality with France.

Italy, after her emphatic gesture of dissatisfaction, led a bloc of States who abstained from voting—Afghanistan, Albania, Austria, Bulgaria, China, Hungary and Turkey. According to General Balbo, Italy is of opinion that the League is controlled by France, Great Britain, and the United States to the point of "muzzling independent Powers." ‡

It was in this troubled atmosphere that the Conference adjourned.

The Resolution fell far short of the hopes of the more ardent advocates of disarmament, who regarded it as a "melancholy document." § It said no word of any immediate reduction and made no proposal to abolish tanks, heavy artillery, or submarines, and though it embodied proposals, important enough, for the prohibition of chemical warfare and the abolition of bombardment of civilians from the air, this was a meagre harvest to those who believe

\* This may be a misprint. The actual Resolution does not deal with naval artillery.

† The actual motion was to the effect that the text of the Resolution should stand. The U.S.A. voted for the Resolution, Mr. Gibson stating later that the American delegation felt that it contained the maximum of agreement that could be achieved.

‡ *Corriere della Sera*, cit. "Geneva," September, 1932.

§ Viscount Cecil in "Headway," September 1932, 165.

in an ideal of peace to be evolved out of a stubborn and recalcitrant world of Nazis and other folk.

#### THE AIDE-MÉMOIRE.

August came and with it another sort of harvest in the form of an *aide-mémoire* handed by the German Foreign Minister to the French Ambassador in Berlin on August 29. Its object was to clear up the question raised by the German delegation on July 22 as to her claim to an equality of rights.

Was Germany to be bound by the Versailles Treaty or to be on the same free footing as all other nations? In a radical form of general disarmament there could be no provisions which Germany would reject provided that the general régime created by the Convention held good for all States. Germany asked for the level laid down for her at Versailles to be the level for all States. The Resolution of July 23 gave no hope of this. In these circumstances none would expect the German Government to accept a result that brings only a trivial alteration in present armaments while maintaining the Versailles status for Germany. Germany had the same right to national security as every other State. Germany therefore asked that the Disarmament Convention should take the place of the Treaty of Versailles (Part V) \* and that in its period of validity and the position after expiry there should be no differential provisions against Germany. The German Government was ready to accept any ban on any weapon which applied to all States in equal measure, but she claimed the right to shape her military system within the framework of the Convention's provisions so as to meet her needs and economic and social conditions.

The present military discrimination was felt as a humiliation by the German people, and at the same time hindered the establishment of a tranquil equilibrium in Europe.†

Thus spake Germany, and thus the first fruit of the Disarmament Conference was a demand for equality in armaments.

Now at first Germany's demand appears on the face of it entirely reasonable. Her main argument is that other Powers base their requirements on necessities of defence, and that as defence is equally necessary to her she is entitled to a degree of equality. There is, however, a flaw, not in the argument, but in its basic presentation. Other Powers since the eleventh hour of the eleventh day of the eleventh month of 1918 base their requirements—and have to base them—not solely on the bare necessities of defence but on the necessity of maintaining the peace of Europe.

France's reply was despatched to Berlin on September 10 and published on September 12.‡ It pointed out that France had given proof of her sincerity in reducing her military budget by 1500 million francs, and while reserving the right to internationalise civil aviation had proposed the total prohibition of aerial bombardment. The

\* That is, the Military, Naval, and Air Clauses for the disarmament of Germany.

† *The Times*, September 7, German Aide-mémoire.

‡ *The Times*, September 13.

centre and pivot of the Republic's doctrine lay in Article VIII of the Covenant, which required the reduction of national armaments to the minimum compatible with national security and the execution of international obligations by common action. No clause existed in the Treaty or in the Covenant by virtue of which a general limitation of armaments should involve the lapse of the permanent stipulations of the Treaty. France sought a guarantee for all nations, small and great, by establishing international control of armaments, by making arbitration general, and by securing the effective execution of its decisions. In information given by the Reichswehr Minister, a clear demand was made for aircraft, tanks, heavy and anti-aircraft artillery, and submarines. Re-armament of this sort would inevitably spread to all States subjected to the Treaty. Thus the whole problem of Central and Eastern Europe would be raised and a competition in armaments would begin again. The question in any case was one for the League. Germany was bound by the Peace Treaty not to change her military status without the decision of the League. Therefore the League was the sole judge, and France could not agree to separate negotiations on the subject.

Italy took Germany's side and her case received strong support in a pronouncement by Mussolini,\* who stated that it must be taken for granted that Germany cannot remain "eternally helpless" among armed nations, and to avoid her absence from the Disarmament Conference her right to juridical equality in the matter of armaments must inevitably be recognised.

In spite of this support from Italy's great Prime Minister there is much to be said for France's point of view on this point. Only thirteen years have elapsed since the Peace Treaty was signed. Because a Disarmament Conference cannot agree to any big measure, is Germany to be allowed to re-arm or to be given "equality of rights"?

Great Britain's view was presented very clearly in a statement issued on September 18,† which did not arouse much enthusiasm in Berlin. "In view of Germany's economic difficulties the initiation of acute controversy must be accounted unwise, and in view of the concessions recently granted to her, it must be accounted particularly untimely. H.M. Government could give no countenance or encouragement to the disregard of Treaty obligations." The preamble to Part V of the Treaty no doubt stated that the object of the Treaty was "to render possible the initiation of a general limitation of the armaments of all nations." But to state the object or aim of a stipulation was a very different thing from making the successful fulfilment of that object the condition of that stipulation. And further, not a word was said in the Treaty as to the manner in which that object—the general limitation of armaments—was to be attained. It was better for these questions of status to be dealt with by friendly negotiations and not by peremptory challenge. This was the view of Great Britain, and it may be added that not a word was said in the Treaty as to the time when or the manner in

\* *Sunday Times*, September 11.

† "Statement of the Views of His Majesty's Government." *The Times*, September 19, 1932.

which general limitation of armaments was to be effected; nor as to what constituted general limitation of armaments.

The wording of the Preamble to Part V of the Treaty \* is equally vague.

Germany was disappointed at the British Note, and a deadlock ensued till, on October 4, Great Britain endeavoured to arrange a meeting in London, but Germany required that the principle of equality be recognised first as a basis of discussion, a point which has not yet been definitely settled. It is not an easy one. Equality of status may mean equality of armaments, but it is just precisely equality of armaments that induces war and an unchallengeable superiority of armaments that ensures peace.

By October 8, however, the Quai d'Orsay was big with a plan—a constructive one “conceived in the spirit of the unchanging policy of France.” In Paris † Great Britain's proposals for a meeting met with a chilly reception, for these “dangereux conciliabules confidentiels” are not favoured by the Grand Etat-Major. Geneva was suggested as a better place of meeting, but as Germany thought it too near the Disarmament Conference, the deadlock continued. On October 23, at Turin, Mussolini at a huge gathering of “camicie nere” declared Germany's claim to juridical parity to be fully justified. “We do not want hegemonies in Europe.” By the end of the month France's new plan was nearly ready and M. Herriot, on October 28, traced its main outline. Armies except those required for possessions overseas were to be reduced to a short service basis, which France was prepared to do on certain conditions. These conditions amount in effect to another big and complicated scheme of collective security.

On the basis of Mr. Stimson's declaration (of August, 1932), that an armed conflict interests all signatories of the Kellogg Pact, who can no longer maintain neutrality to an aggressor, France asks all signatories of the Pact in the event of its violation to break off economic and financial relations with the aggressor. The difficult point here, of course, will be to find the aggressor. On this basis signatories of the Covenant will be called upon to implement their obligations under Article XVI, which they will be in a position to do without the risk of opposing the neutrality of the United States.

The various States are regarded as moving in concentric circles, somewhat after the manner of electrons round the nucleus of an atom; in the outer circle are signatories of the Kellogg Pact; in the middle circle signatories of the Covenant and Locarno; in the inner circle those States (presumably France, Poland and Czecho-Slovak) who are conscious of a special danger, who will conclude regional pacts of mutual assistance.

The weakness of the French plan lies in the difficulty of enforcing peace with certainty by a menace of force without an immense superiority of force in reserve, which the League can never possess

\* Temperley, Peace Conference, 3/187. The so-called “pledge” was indefinite as to time and method, and from a British naval point of view has been fulfilled in the Treaties of Washington (1922), and of London (1930).

† M. Herriot, *The Times*, Oct. 8.



while Russia and the United States stand outside it, and which it will never get from democratic peoples.

The French plan is not primarily a plan of disarmament; it is a new version of the old Protocol of 1924—an immense and very complicated plan of security, assured by national contingents armed with the latest equipment ready to rush to the point of aggression.

It is true that Great Britain will be under no obligations beyond those incurred at Locarno, but here, again, there is a difficulty. The Treaty of Locarno may place limitations on the conditions of our entry to a war, but once we enter a war no limitations can be placed on the forces we may have to send. It is not the first national contingent of 20,000 men at the disposal of the League that will be the difficulty; the difficulty will be to find the million or two million men required to follow them. These schemes of collective action tend to involve a nation in all sorts of entanglements in spheres of policy and interest quite outside its control and may finally call for forces whose magnitude can be measured only on the day of victory. And they will weigh specially heavily on nations who have the habit of honouring their obligations.

On its naval aspect the French plan has in view the possibility of a Mediterranean Pact.\*

Great Britain has put forward simpler proposals, and Mr. Baldwin on November 10, in the House of Commons, spoke on the problem of air disarmament. He puts his finger on the vital aspect of air warfare, viz. that there is no such thing as air defence and that the only defence lies in counter-reprisals against an enemy's civilians. As for the prohibition of bombing, it would probably, he thought, be no more effective in war than the prohibition of gas had been in the past. He himself favoured the abolition of all air services; but even then civil aviation—potentially military—would remain, and the question of international control should be studied. It was for the younger generation to consider what they wished to be done with this terrible engine of flying.

On November 17, Sir John Simon at Geneva presented a further declaration of British policy which was published the same day.†

Germany's claim of equality of status should be met and all European states should join in a solemn affirmation that they will not in any circumstances attempt to resolve any present or future difference between them by resort to force.

On the basis of this assurance, the German claim to equality should be met by including the limitations on Germany's armaments in the Disarmament Convention, which would supersede Part V of the Treaty of Versailles. The realisation of the principle of equality would be achieved in a programme of stages.

In the category of (a) Qualitative Disarmament, for the first stage, Great Britain suggested in (1) Naval Armaments:—

(a) Substantial reduction in the size of the capital ship.

\* For French plan, see M. Herriot's speech, Oct. 28; M. Paul Boncour (Geneva). Nov. 4; *The Times*, Nov. 15.

† Declaration of Policy, etc., Miscellaneous No. 11, Cmd. 4189, 1932.

(b) Limitation of cruisers to 7,000 tons mounting 6-in. guns.\*

(c) Abolition of the submarine.

In (2) Land Armaments :—

(a) Tanks should be abolished above a given weight.

(b) Limitation of mobile land guns to 105 mm.

In (3) Air Armaments :—

(a) The entire abolition of military and naval machines, and of bombing (apart from use of machines for police purposes in outlying places) combined with an effective international control of civil aviation.

(b) As a practical and immediate measure (1) the immediate reduction of all air forces to the level of those of the United Kingdom ;

(2) a cut of  $33\frac{1}{3}$  per cent. all round in the air force thus reduced ;

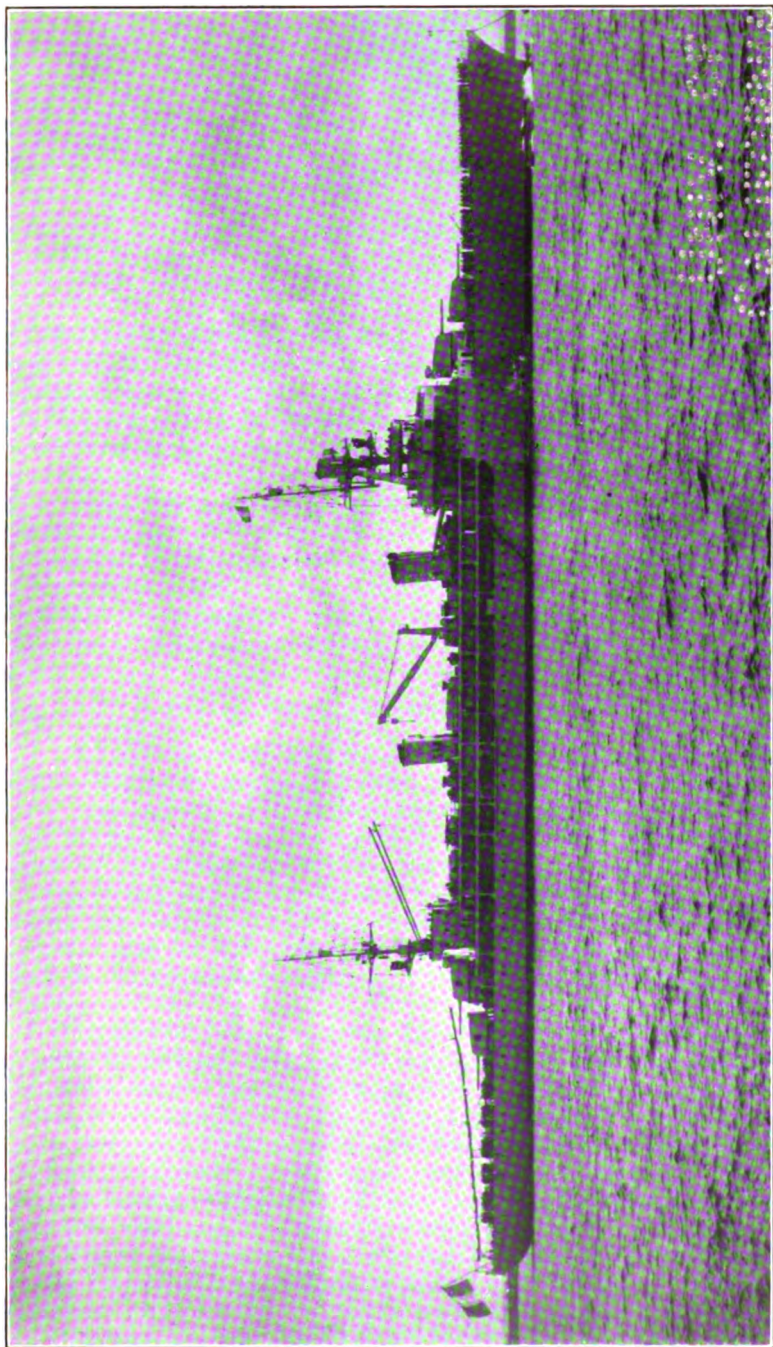
(3) a limitation of the unladen weight of military aircraft.

These are large proposals, and to some it will appear that peace does not lie in material but in "moral" disarmament, and where there is no strong or universal impulse in this direction, diplomatic discussions are fated to remain as futile as the hammering of cold iron. Certainly the task of building a bridge between the different proposals is no light one. But possibly the aeroplane, so destructive in war may, with Sir John Simon on board, be equally constructive in peace.

Meanwhile we are bound to navigate carefully, steering clear of the shoal of unilateral disarmament on the one hand and the quicksands of entangling and immeasurable obligations on the other.

ALFRED C. DEWAR,  
Captain, R.N.

\* This differs slightly from the limit of 6·1 in., chosen in the London Treaty of 1930, in order to include French 15·5 cm. guns. See Brassey, 1931, p. 72.



THE FRENCH TRAINING CRUISER JEANNE D'ARC, 6 496 TONS.

*Completed 1931.*

*(By courtesy of the French Ministry of Marine.)*

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## CHAPTER V.

### NAVAL EDUCATION.

#### INSTRUCTOR OFFICERS AND SCHOOLMASTERS.

THE Instructor and Schoolmaster Branches of the Royal Navy are separate but complementary. Both are composed of officers entered specially and primarily to teach school subjects, the former to officers, the latter to men. Each has its own history, and has evolved on its own lines to its present state. Neither is much known outside the Service, and neither has a counterpart in other navies.

In the Navy, as in other professions that require scientific knowledge and habit of thought, a transitional period of part school and part practice intervenes between entry from school and full practice. This period is spent at sea, and the Instructor Officers and Schoolmasters afloat may be regarded as substitutes for the schools and colleges that young professional men ashore can attend.

#### THE INSTRUCTOR BRANCH.

Although the employment in a ship of war of a person to teach the young gentlemen navigation dates back to the seventeenth century, the development of a definite Instructor Branch with status and conditions of service analogous to those of the Accountant and Medical Branches was delayed until late in the nineteenth. The development was but little affected by changes in the system of entry and training of cadets, but followed that of ships and weapons, which called for wider scientific knowledge on the part of their users—a demand that was reflected in the examinations for the rank of lieutenant.

The earliest Schoolmasters—for so the ancestors of the modern Instructor Officers were called—employed afloat were either persons specially entered for the purpose, with the pay of an ordinary midshipman, or chaplains. They were employed by the captain of the ship, who paid them a private allowance out of the funds provided him by the parents of the young gentlemen he took to sea with him. In the smaller ships, this allowance proved insufficient to attract suitable men, and in 1702 an Order in Council of Queen Anne authorised the payment from the public funds of a bounty of £20 a year, besides the pay of an ordinary midshipman, to “ingenious persons” who should “enter themselves on board Her Maj<sup>ty</sup> Ships of the 3rd, 4th, and 5th rates to instruct the youth in the Art of Seamanship.” The test of ingenuity was made by the Corporation of Trinity House of Deptford Strond. In the larger ships matters were left entirely in the hands of the captain. The Schoolmasters

of these early days do not appear to have been employed ashore. The Naval Academy at Portsmouth, subsequently known as the Naval College, established in 1729, was staffed by civilians. A few only of the young gentlemen that eventually became officers passed through it. They went to sea as volunteers of the first class.

At the beginning of the nineteenth century the whole question of the early training of sea officers was reviewed, and many practices that had arisen during the Napoleonic Wars were regularised. A demand for wider scientific knowledge had brought about examinations for the rank of lieutenant of wider scope. Preparation for these examinations called for Schoolmasters of correspondingly higher scholastic qualifications, and these could hardly be obtained without increased and improved position. The result was a long series of minor changes marking the slow growth of the Instructor Branch. For the test of ingenuity by Trinity House was substituted a classical and mathematical examination at the Naval College, Portsmouth, and later on at Greenwich, from which university graduates with honours were exempted. The private allowance paid by the captain was standardised in 1812 at a tuition fee of £5 per annum from every young gentleman or volunteer of the first class, "the same to be stopped out of his pay." In 1840, the pay was made from 7s. to 10s. a day, and the bounty was abolished; in 1867, it was raised to equality with that of chaplain, and in 1870 it was fixed at 12s. a day on entry, rising to 22s. a day after twenty-two years' service: at that rate it remained until 1919. The title of Schoolmaster was altered to that of Naval Instructor in 1842, to avoid confusion with that of Seamen's Schoolmaster (q.v. *infra*). Appointment by commission was instituted in 1861, and in the same year the distinctive blue stripe, that is still worn, was appropriated to the branch; the wearing of uniform remained optional, however, until 1891. From 1864 Naval Instructors were advanced in rank according to seniority, their rank on entry being that of lieutenant, and after fifteen years' service that of commander. They could enter at twenty-two and were retired at sixty until 1899; entries after that date were to be retired at fifty-five.

Chaplains, when willing and qualified, continued to be employed in the double capacity and then received, in addition to their own pay, the standard tuition fees and, at first the whole, later three-quarters, and, finally, half the pay of a Naval Instructor. In spite of these improvements in pay and position, suitable men were never easy to come by. The number of men that graduated each year with honours in mathematics or science, that were physically fit for the Navy, that wished to teach and that wanted to go to sea, was never large, even when compared with the small number of entries required. The number of such men also in Holy Orders was smaller still.

The duties of a Naval Instructor at sea changed but little during this period. They were purely scholastic and concerned with young officers only. Although, after 1852, one Naval Instructor was appointed to each Boys' Training Ship to act as headmaster, school for boys in sea-going ships was conducted by a Schoolmaster under the supervision of the chaplain. The Naval Instructor taught

navigation, mathematics, mechanics, physics, and French in accordance with syllabuses laid down in the regulations and in preparation for the examination for the rank of lieutenant. He was also responsible for supervising the sight-taking required of midshipmen by the regulations, being directed to be present whenever such sights were taken.\* The examinations, which were, and are still, held at the Royal Naval College, Greenwich, ultimately control the whole of the teaching, both as regards style and subject. The Naval Instructor had no official place in the fighting organisation of the ship, though he was usually employed unofficially in connection with gunnery and torpedo control, when, in later years, those developed.

The *Illustrious*, the predecessor of the *Britannia*, became a training ship for cadets in August, 1857, and from that date young executive officers did a period in her as cadets, a transitional period at sea as cadets or midshipmen, and, after 1873, a further school period at the Royal Naval College, Greenwich. In principle, though the *Britannia* has been replaced by the Royal Naval College, Dartmouth, and though there have been other changes in detail, the same system obtains at the present day. In the *Britannia*, a senior Naval Instructor acted as headmaster and had under him a staff of juniors and a few civilians: at the Royal Naval College, Greenwich, the lecturers to sub-lieutenants were Naval Instructors, of whom the senior held the position, but not the title, of professor of navigation, and of whom another was appointed as examiner and was responsible for all examination papers. These posts were usually filled by the older officers who had been at sea for several years and who held them until they retired.

At no time was any member of the branch its titular head. A Director of Naval Education was appointed in 1864, but he was not a Naval Instructor. The post was abolished in 1874 and its functions divided between a civilian Director of Studies at Greenwich, where the Royal Naval College had been opened the previous year, and an Inspector of Schools at the Admiralty, who might be a naval officer. In this connection it should be mentioned, for the benefit of the uninitiated, that the courses for sub-lieutenants are but a small part of the work of the Royal Naval College, Greenwich. There are courses of different lengths for Constructors, for Electrical Engineers, for Gunnery, Torpedo, and other specialist Executive Officers, for Engineer Officers, and for Marine Officers among others. The staff consists of civilian professors and assistant professors together with several lecturers, of whom some are Instructor Officers. The appointments of Naval Instructors were drafted for the Second Sea Lord, the member of the Board of Admiralty specially responsible for all naval education, by the Chaplain of the Fleet.

The numbers on the active list varied with requirements, that is, with the number of ships carrying midshipmen. In January, 1900, there were seventy-six Naval Instructors, of whom forty-three were also chaplains. Of these, forty-three were in ships with midshipmen

\* A sight is a timed sextant altitude of a star or the sun.



and twenty-four in training ships and shore establishments. Several of the chaplains were employed in that capacity only.

In 1903-4 the whole system of entry and training of young officers was radically altered. It was decided to abolish the Britannia, to enter cadets through the Royal Naval Colleges at Osborne and Dartmouth, and to send them to sea as Midshipmen at from seventeen and a half to eighteen years of age, approximately two years older than before. The opinion was strongly held that the raising of the age would obviate the necessity for school during the transitional period at sea. It was expected that boys who had been kept at special naval schools until they were eighteen would get sufficient grounding to enable them to assimilate the technical parts of their profession while practising it, without the help of professional teachers. If this were so, Naval Instructors might be dispensed with at sea and the whole branch might be allowed eventually to die out. In 1904 the entry of Naval Instructors was closed, but they continued to be employed at sea when available, and, at any rate, until the last of the Britannia entry of cadets had become sub-lieutenants. They were not employed at the new colleges, which were staffed by civilians, except to teach the rudiments of navigation. Several were, however, appointed to the training cruisers attached to the colleges.

At the same time as the system of cadet entry was changed, the office of Director of Education was revived and that of Director of Studies at Greenwich was absorbed in it. The new Director, Professor Ewing, later Sir Alfred Ewing, had an office at Greenwich as well as at the Admiralty, and was assisted by a Deputy-Superintendent of Examinations and a Deputy-Inspector of Naval Schools, both of whom were Naval Instructors. Among his duties was that of drafting the appointments of Naval Instructors for the Second Sea Lord.

After Professor Ewing joined the Admiralty drastic changes were made in the examinations for the rank of lieutenant. They were raised in standard, widened in scope, and a style similar to that of the Mechanical Sciences Tripos at Cambridge was introduced into them. These alterations called for a change in the scope and style of the teaching at sea as well as at Greenwich. As most of the Naval Instructors of that date had taken honours in mathematics, few experienced much difficulty in adapting themselves to the new conditions. Many welcomed the change as giving them opportunity to bring their teaching nearer to real life.

In July, 1914, excluding chaplains acting in the dual capacity, there were thirty-two Naval Instructors on the active list. Of these but five were in ships with midshipmen, the remainder being in training ships or in shore establishments. In October, 1914, two months after the outbreak of the War, the Navy List shows seven afloat and the rest ashore in the training establishments or at the Admiralty, where six that were qualified as interpreters in foreign languages were employed in the Intelligence Division. This distribution was altered as the war went on, and more officers of experience were required for the training establishments, including those for the Royal Naval Air Service.

At the outbreak of War all the cadets at Osborne, Dartmouth, and in the Training Cruisers, to the number of five hundred and fifty, were sent to ships of the Grand Fleet to continue their training under War conditions. After a few months' experience it was decided to take advantage of the long periods of waiting and enforced inactivity that the progress of the War involved to attempt to make good the loss of schooling that these young officers had incurred by their premature removal from the colleges. To this end, a considerable number of Naval Instructors were entered for temporary service and, after a preliminary course at Greenwich, sent to the ships of the Grand Fleet in which midshipmen and cadets were borne. This was in 1915, and during the next three years more were entered in like manner. Most of these men were already members of the scholastic profession, and very few of them had any desire or intention to adopt that of Naval Instructor as a career. In consequence, of the fifty-seven serving at the end of the War, only fourteen took advantage of the opportunity to remain in the Service that arose shortly afterwards.

In 1917 Sir Alfred Ewing relinquished the post of Director of Naval Education and, after a short hiatus, was replaced by a civilian Adviser on Education with similar functions, but with his Greenwich office transferred to the Admiralty. The Deputy-Inspector of Naval Schools and the Deputy-Superintendent of Naval Examinations were also transferred to the Admiralty. The post of Director of Studies at Greenwich was not revived, but the exercise of his former functions was entrusted to a board composed of the Captain of College and the Professors, with the senior Instructor Officer, who was appointed Professor of Navigation and Dean of College, as chairman *ex-officio*. The two Deputies and the Dean are now Instructor Captains.

In 1919 the conditions of pay, service, and training of the whole Navy were reviewed and revised. The Instructor Branch was reconstituted in its present form and the entry to it was reopened. The use of chaplains in the dual capacity was discontinued, the functions of both officers having so changed that one individual could no longer perform both efficiently. The title of Naval Instructor was abolished in favour of those of Instructor Lieutenant, Lieutenant Commander, Commander, and Captain, a nomenclature analogous to that adopted for the Accountant and Medical Branches. Under the existing regulations candidates for entry have to be under thirty years of age and must be graduates with honours in mathematics, mechanical sciences, or natural sciences. On entry they go through a six months' course at Greenwich, principally to gain acquaintance with the principles of navigation, and then do shorter courses at the technical establishments at Portsmouth and at the Compass Observatory. After that they are sent to sea to work out their own salvation. As no ship, other than a training ship, carries more than one Instructor Officer, they have no shipmate of their own cloth on whom to lean and have to trust to the regulations and their own sense.

All Instructor Officers can reach the rank of commander, but promotion to Instructor Captain is by selection from among officers of twenty or more years' service. They are retired, like other officers,

at fifty, unless promoted, when they can serve till they are fifty-five. The tuition fees have been abolished, and the pay increased in a similar manner to that of the officers of other branches. The duties at sea have been altered; the Instructor Officer is now responsible to the captain for all the scholastic work of the ship, including that of the Schoolmaster (q.v. *infra*); he has a definite place in the fighting organisation, and is a member of the cypher staff. The subjects taught to midshipmen are those already mentioned, navigation being a first charge. The subjects and their presentation are a less difficult problem than the organisation of the classes and the division of the subjects into sections suited to the ever-changing conditions of life at sea. The supervision of school for the ship's company resolves itself into helping the Schoolmaster to arrange his classes and generally supporting his efforts. Most Instructor Officers take one or more classes of petty officers and men at voluntary school in the evening, though it is not part of their prescribed duties to do so. The success of the joint efforts of the two officers depends on personality, adaptability, and good co-operation.

As a fighting station, and during fleet exercises, the Instructor Officer is employed in keeping an up-to-date plan of all known movements of "own" and "enemy" ships. During an exercise, which may last three days, this involves the consideration of several hundred signals and messages and the presentation of the information to be derived therefrom in pictorial form on a chart. The cypher staff is under the Accountant Officer of the ship. Its members keep days on, when they have to be available to decypher any messages that come in and to cypher any that the commanding officer may desire to send.

In each fleet the senior Instructor Officer is appointed as Fleet Education Officer on the staff of the Commander-in-Chief, to whom he acts as adviser on scholastic matters. His colleagues can turn to him for advice and he has to keep in touch with the scholastic work of all ships in the fleet, each of whom he visits in connection with Admirals' inspections. In the Mediterranean Fleet he is also in charge of the Fleet Education and Vocational Training Centre at Malta.

Much wider use is made of Instructor Officers in shore establishments than in the years before the War. They have more scope and encouragement to develop their own subjects and to apply their knowledge of them to Service requirements. They are employed at Greenwich, at the Royal Naval Engineering College, Keyham, at Dartmouth, in the Cadet Training Ship, at the Compass Observatory, at the Signal School, and at the Boys' Training Establishments. All of them are expected to keep themselves ready to lecture on navigation, mathematics, mechanics, and, to a less extent, on physics up to the standard required of sub-lieutenants at Greenwich. Those who have shown themselves competent to do so may be called upon to teach other subjects, such as metallurgy, chemistry, optics, and wireless telegraphy, or the more advanced and more specially applied parts of mathematics and mechanics required by specialist officers at Greenwich or by Engineer Officers at Keyham.

In the Navy List for October, 1932, there were seventy Instructor Officers on the active list, of whom two were Instructor Captains. Half of them were in ships with midshipmen and half ashore in educational establishments, it having been the practice for the past few years to make sea and shore appointments alternate as far as Service requirements permit. The appointment of Deputy-Superintendent of Naval Examinations was held temporarily by an Instructor Captain on the retired list.

The future of the branch depends on policy, on the number of ships in commission bearing midshipmen, and on the number of shore courses it is intended that officers should attend.

#### SCHOOLMASTER BRANCH.

The desirability of affording opportunity to seamen to educate themselves and so better to fit themselves for the higher ratings and eventually for warrant rank was first officially recognised in 1837. In that year the rating of Seamen's Schoolmaster, petty officer 1st class, was established to hold voluntary school on board and to teach seamen reading, writing, arithmetic, plane trigonometry and the use of logarithms and the traverse table.

After the introduction of continuous service in 1852, the Seamen's Schoolmasters in ships of the fleet and in training ships were required to teach boys. In 1862, their title was altered to that of Naval Schoolmaster, and from that date they were required to hold a certificate from the Council on Education.

To make the service more attractive and so to secure schoolmasters fitted to meet the growing needs of the Navy, Naval Schoolmasters were rated Chief Petty Officer in 1867, ranking with Masters-at-Arms and drawing the same pay. They wore a round jacket with three buttons on the cuff. In the training ships, the Head Naval Schoolmaster was given acting warrant rank and received an extra two shillings a day while so employed. He also received £20 a year for training pupil teachers, who, after passing through a normal college ashore, could be rated Naval Schoolmaster. A Head Naval Schoolmaster wore black braid on his sleeve. School in sea-going ships was never very successful, and in 1889 Naval Schoolmasters were withdrawn from all of them. Thenceforward they were employed in training ships and gunnery and torpedo school ships only, the Head Schoolmasters being given the substantive rank of Warrant Officer, ranking with carpenters and wearing the same uniform.

From about the same date, the scope of the work in school rapidly widened. The standard of scientific knowledge required of the higher ratings and of Warrant Officers steadily rose and it became increasingly desirable to provide all ratings with greater facilities for general education. In particular, the wider use made of electricity and the invention of wireless-telegraphy called for specially trained teachers at the Naval Technical Schools: these were found among the Naval Schoolmasters. In 1904 the difficulty in obtaining suitable candidates for Naval Schoolmasters led to the establishment of the commissioned rank of Chief Schoolmaster,

equivalent to that of Chief Carpenter, to an increase in the number of Head Schoolmasters, and to increased pay.

In 1912, a committee, known as the Hood Committee, was appointed to consider the whole question of the training and advancement of ratings and their eventual promotion to warrant officer. It recommended, among other things, the institution of educational, or more accurately, scholastic examinations as qualifying tests for advancement and promotion. These recommendations were approved by the Admiralty, but action to give full effect to them was delayed until 1918 by the intervention of the Great War.

After a year of War, the Commander-in-Chief of the Grand Fleet recommended, partly at the request of the men themselves, that Schoolmasters should be appointed to all ships of his fleet down to and including light cruisers. He proposed by this means to give to both men and boys some of the schooling they would have normally received at the training establishments ashore and also to do something to relieve the tedium of long evenings on board in harbour. As a result, some 240 Schoolmasters were entered for temporary war service and sent to the Grand Fleet. Many of them were experienced and successful teachers at the public and other schools, to which they returned at the end of the war.

The experiment was successful, and in 1916 all Naval Schoolmasters were given warrant rank. Two years later the prospect of promotion to Senior Master and to Headmaster was added.

After the War it was decided to give full effect to the recommendations of the Hood Committee. The regulations were altered and a series of qualifying examinations was instituted. The most advanced of these is the "Higher Educational Test," which includes papers in General Knowledge, History, Geography, Mathematics, Mechanics, Electricity and Magnetism, and Navigation. Certificates that carry weight both afloat and ashore are awarded on the results of this examination and are desired by many men as evidence of their standard of general education.

In order to provide teachers for all these examinations at sea, in the depots, and in the training establishments, as well as to continue the work in the naval technical schools, it was necessary to enter a large number of schoolmasters for permanent service. Competent and suitable men proved somewhat difficult to obtain and in consequence the branch was gradually reorganised and brought to its present state, in which conditions accord with those ashore as far as circumstances permit. Candidates have now to be between twenty-one and thirty years of age and must be qualified to teach mathematics and science in a secondary school. The large majority are certified teachers and 25 per cent. of the present list hold university degrees. On entry, Schoolmasters are on probation and are sent to the Defiance, the torpedo training-ship at Devonport, where they receive a six-months' preparation for their future work. They start with the rank of Warrant Officer and after fifteen years' service are promoted, if recommended, to commissioned officer from warrant rank. Some of them are selected

much earlier for promotion to Senior Master, with higher pay and increased prestige. A few are subsequently promoted to Headmaster, with the rank of Lieutenant, and after eight years with that of Lieutenant-Commander. A very select few of these may be granted the rank of Commander, with increased pay. As requirements permit, Schoolmasters are sent to the Royal Naval College, Greenwich, for a six-months' advanced course in mechanics, physics, and navigation. Selection for promotion to Senior Master is made from officers who have been through this course successfully. The pay runs, at present, from 10s. 8d. a day on entry to 32s. a day after three years as Headmaster of lieutenant-commander's rank. The distinctive blue stripe of the officers of the complementary branch is worn on the sleeve. Retirement comes at fifty-five.

At sea, Naval Schoolmasters teach boys in the forenoon and afternoon and hold a variety of classes, at which attendance is voluntary, for Chief Petty Officers, Petty Officers, and men in the evening. In the larger ships they have the assistance of an "acting" schoolmaster, who might sometimes be described as a pupil-teacher. There is an Instructor Officer to help and advise them in ships that carry midshipmen, and the Fleet Education Officer will see them from time to time, but in the main, and particularly in the smaller ships, they stand alone. Above all they must be adaptable, for conditions at sea are continually changing and voluntary classes cannot be graduated as nicely as in a school ashore. The many successes that Naval Schoolmasters achieve are a tribute not only to their ability to teach, but also to their personality and perseverance.

Schoolmasters have a place in the fighting organisation of the ship, being employed on the strategic plot, and they are members of the cypher staff. They are responsible for the School Reference Library, a limited collection of standard works on technical subjects, which they can issue to ratings preparing for examination. Another important part of their duties at sea is the management of the ship's library—a general library, consisting mainly of works of fiction, supplied by the Admiralty for the use of the ship's company. The Schoolmaster can and does do a great deal to guide the men's reading and to introduce them to good literature.

Many Schoolmasters make electricity their special line and apply their knowledge to wireless telegraphy and to the many circuits and instruments that are fitted in modern ships.

Employment ashore is in the Ganges and the St. Vincent, where seamen boys are trained and schooled on entry; in the depots and naval barracks, where classes are prepared for the examinations already mentioned; at the technical schools and at the Mechanical Training Establishment, where men are trained to hold special ratings. For over thirty years a specially selected senior member of the branch has been employed in the Education Department at the Admiralty.

G. V. RAYMENT,  
Instructor Captain, R.N.

COMPARATIVE PARTICULARS OF REPRESENTATIVE CAPITAL SHIPS.

	GREAT BRITAIN.	JAPAN.	UNITED STATES.	FRANCE.	ITALY.	GERMANY.
	Nelson. Rodney.	Nagato. Mutsu.	Colorado. Maryland. West Virginia.	Bretagne. Lorraine. Provence.	Duilio. Doria.	Deutschland. Lothringen. Braunschweig. Elsass.
Displacement . . . .	33,500 tons.	32,750 tons.	32,600 tons.	22,200 tons.	21,555 tons.	10,000 tons.
Length . . . . .	710 ft. 0 in.	700 ft. 0 in.	624 ft. 0 in.	544 ft. 0 in.	575 ft. 0 in.	609 ft. 0 in.
Breadth . . . . .	106 ft. 0 in.	95 ft. 0 in.	97 ft. 6 in.	88 ft. 6 in.	91-8 ft. 0 in.	67 ft. 6 in.
Mean draft . . . .	30 ft. 0 in.	30 ft. 0 in.	30 ft. 6 in.	29 ft. 0 in.	29 ft. 0 in.	21 ft. 0 in.
H.P. . . . .	45,000.	46,000.	28,900.	29,000.	24,000.	54,000.
Speed . . . . .	23 knots.	23 knots.	21 knots.	20 knots.	21 knots.	26 knots.
Armament . . . . .	Guns. 9 16-in. 45 cal. 12 6-in. 50 cal. 6 4-7 in. 50 cal. A.A.	Guns. 8 16-in. 45 cal. 20 5-5 in. 50 cal. 4 3-in. A.A.	Guns. 8 16-in. 50 cal. 12 5-in. 50 cal. 5 5-in. 51 cal. A.A.	Guns. 10 13-4 in. 45 cal. 18 5-5 in. 55 cal. 8 3-in. A.A. 4 3-pdr. A.A.	Guns. 13 12-in. 46 cal. 16 6-in. 45 cal. 13 14-pdr. 6 14-pdr. A.A.	Guns. 6 11-in. 45 cal. triple mtd. 8 5-9 in. 50 cal. 4 3-4 in. A.A.
	Torpedo Equipment. 2 24-in. submerged torpedo tubes.	Torpedo Equipment. 4 21-in. submerged torpedo tubes.	Torpedo Equipment. 2 21-in. submerged torpedo tubes.	Torpedo Equipment. 4 18-in. submerged torpedo tubes.	Torpedo Equipment. 2 18-in. broadside submerged torpedo tubes.	Torpedo Equipment. 6 20-in. above-water torpedo tubes.
Protection . . . . .	14-in. water-line belt. 16-in. to 9-in. bar- bettes. 6-4 in. deck. Bulge protection.	12-4 in. water-line belt. 14-4 in. barbettes. 7-in. to 3-in. deck. 12-in. conning tower.	16-in. to 14-in. water-line belt. 18-in. to 9 in. bar- bettes. 5-in. to 3-in. pro- tective decks. 16-in. conning tower. 16-in. funnel bases.	10-4 in. to 7-in. water-line belt. 11-in. barbettes. 3-4 in. to 1-4 in. pro- tective decks. 12-4 in. conning tower. 10-in to 6-in. upper armour.	9-4 in. to 5-in. water-line belt. 9-4 in. barbettes. 6-4 in. to 3-in. pro- tective deck. 11-in. conning tower. 6-4 in. citadel.	5-in. water-line belt. 7-in. barbettes. 5-in. to 1-4 in. pro- tective decks. 9-in. conning tower.



## CHAPTER VI.

### A PROBLEM OF THE NAVY.

#### THE CAPITAL SHIP.

It is somewhat difficult to forecast, under present circumstances, the lines on which the capital ship of the future is likely to develop. Financial considerations, the "to be" or "not to be" of submarines and aircraft, with perhaps imperative conditions which may be laid down by coming Disarmament Conference or Conferences, all tend to complicate and confuse the possibilities.

It is to be hoped that, if battleships are to continue to exist, the mistake will not be made of limiting the displacement of individual units, as was done in the case of the 10,000-ton cruisers, where each was confined to a definite maximum tonnage, bringing into being types of vessels which, through no fault of the designers, have been more or less condemned as fighting units by all responsible naval authorities. It is a generally accepted view that if such limitation had not been imposed the total allowed tonnage could have been much better utilised.

It appears at the outset absurd to fix on an arbitrary standard displacement, which does not allow a powerfully armed vessel to be also well armoured and protected, as apart from the protection to the vitals of the vessel, consideration should also be given to the personnel. Would it not be more satisfactory to fix a global tonnage, limiting at the same time the calibre, but not the number, of the guns, leaving it to the ingenuity of the naval experts of the various maritime nations to develop the largest number of fighting units suitable for their individual requirements, within the global tonnage allowed?

In order to obtain a comprehensive idea of the present position of the battleship question it is desirable to have before us particulars and sketches of the various representative up-to-date battleships of the principal maritime countries, and to place them in the order of magnitude of displacement, rather than necessarily under the order of importance of the countries referred to. For this purpose on the immediately following pages are given first the tabulated comparative figures for the six representative battleships, followed by comparative sketches of the type vessels referred to in the descriptions.

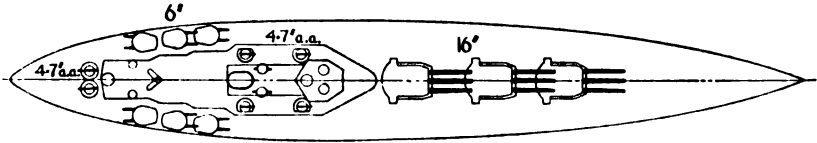
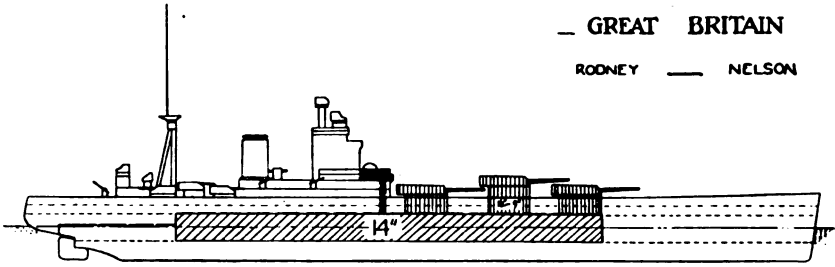
#### GREAT BRITAIN.

##### NELSON—RODNEY.

Taking first the British vessels. The armament is magnificent, the nine 16-in. guns all having enormous arcs of training, the only apparent objection being the inability of either set of triples or any

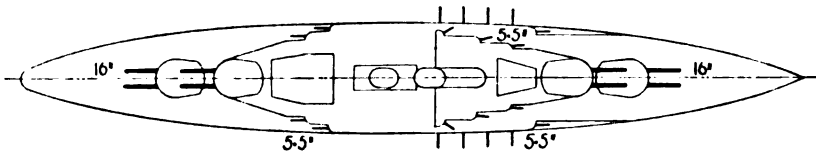
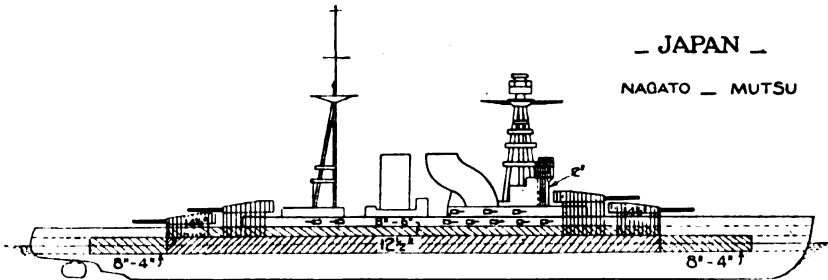
— GREAT BRITAIN —

RODNEY — NELSON



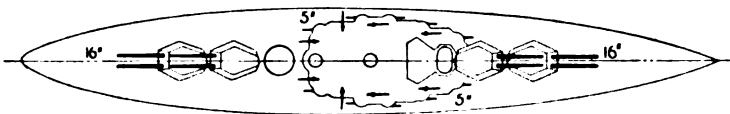
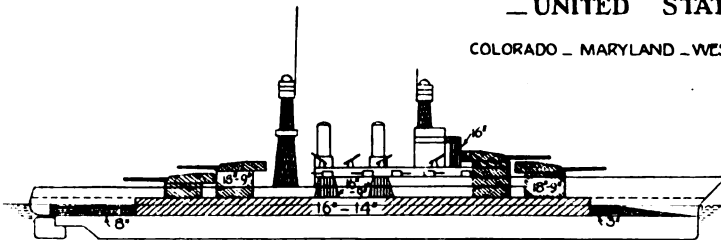
— JAPAN —

NAGATO — MUTSU



— UNITED STATES —

COLORADO — MARYLAND — WEST VIRGINIA



single gun to fire direct astern. The 16-in. guns are all triple mounted, requiring therefore a smaller weight of armoured protection, and being more economical of internal space than if the same number were twin mounted, but possessing at the same time the disadvantage of "many eggs in one basket," restricted astern fire, and the necessity of lumping together all the main controls. The twelve 6-in. guns of the principal auxiliary armament are twin mounted on the upper works, worked by power, with revolving armoured shields, their great above-water height giving them a maximum efficiency of range so long as they are not put out of action by enemy projectiles. It will be noted that in these vessels the anti-aircraft guns are of large calibre, viz. :—4·7-in. The torpedo equipment consists of two 24-in. broadside torpedo tubes. The maximum range of the 16-in. guns may be assumed to be about 88,000 yd. (at a maximum elevation of  $40^{\circ}$ ) firing a projectile weighing 2,000 lb.

These vessels have a fairly broad 14-in. water-line belt which runs throughout the midship part, but the water-line ends are practically unprotected. The 16-in. barbettes to the triple-mounted 16-in. guns appear to be as adequately protected as circumstances would seem to require, but there is very little protection to the ordinary personnel, whilst the principal control and director stations are (as necessarily compelled by the gun arrangement) huddled together, forming a target of large dimensions, which, in the case of serious damage by high explosives, would make it necessary to operate from the secondary controls provided elsewhere. There appears to be ample deck protection, either against plunging shot or aerial attacks. The arrangement of the armour is shown in the accompanying diagram.

The propelling machinery of the vessels consists of geared turbines, with Yarrow large-tube boilers.

## JAPAN.

### NAGATO—MUTSU.

In these vessels we have a striking example of a common-sense compromise with respect to armoured protection, armament, and speed. The eight 16-in. guns of the main armament are all twin mounted, four being capable of firing direct ahead, and four astern, whilst all are arranged to fire on each broadside through large arcs of training. The principal auxiliary armament consisting of twenty 5·5-in. guns is well protected by the 6-in. citadel armour, the guns being manipulated by power. The anti-aircraft equipment consists of four 3-in. A.A. guns, whilst the torpedo equipment includes four 21-in. above-water and four 21-in. submerged torpedo tubes. Provision is made for the carriage of one or more aircraft.

The maximum range of the 16-in. guns is stated to be 35,000 yd. (with a maximum elevation of  $35^{\circ}$ ) firing a projectile about 1,900 lb.

The main water-line belt is  $12\frac{1}{2}$  in. in thickness amidships, extending practically over the whole length of the barbette bases, and

reaching from a reasonable depth below water to the height of the main deck, continued from there in thicknesses of 8 in. and 6 in. to the height of the upper deck, forming incidentally an armoured citadel for the twenty 5·5-in. guns of the auxiliary armament. The armour belt is continued well towards the forward and after ends, being gradually reduced in thickness to 8 in. and 4 in. This arrangement, it is evident, gives an area of side protection of great efficiency, providing at once the safety of the personnel, and the security of the 5·5-in. guns with their crews, good protection to the funnel bases, and a large amount of armoured stability. The barbettes for the 16-in. guns are exceptionally well protected by 14½-in. armour, and the horizontal protection leaves little to be desired, varying from 3 in. in the less vital parts to 6 in. and 7 in. over the machinery, magazines, and steering compartment.

The propelling machinery consists of geared turbines with Kampon boilers.

## UNITED STATES.

### COLORADO—MARYLAND—WEST VIRGINIA.

There would appear to be something lacking in the way in which large displacements in this case have been utilised for the various ends that designers and seamen should have in view when considering desirable requirements of capital ships. The speed is low, the main armament of 16-in. guns is less in number than in ships of Great Britain, and notwithstanding the adequate thickness of the belt and barrette armour, the horizontal protection appears to be weak, and the entirely unarmoured forward end of the vessels, if shot away at the stem in the neighbourhood of the water-line, would diminish the speed by a matter of knots.

The main armament is well arranged so far as the emplacement of the guns is concerned. There are eight 16-in. guns, all twin mounted, two pairs forward and two aft, arranged so as to have four firing direct ahead and four direct astern, with considerable arcs of training on each broadside. The main auxiliary armament consists of twelve 5-in. guns mounted singly on the upper deck in thin armoured shields, and five 5-in. A.A. guns are carried in addition as anti-aircraft equipment and placed on the superstructure deck. The torpedo equipment consists of two submerged 21-in. broadside torpedo tubes.

The maximum range of the 16-in. guns is given as 33,000 yd. (at a maximum elevation of 30°), firing a projectile weighing over 2,000 lb.

The vessels are also fitted with two catapults on the upper works for launching the complement of seaplanes with which they are provided.

Dealing with the protective elements, the water-line belt is 16 in. to 14 in. thick amidships, and runs well over the bases of the forward and after barbettes, extending from a good depth below the water-line to the height of the main protective deck,

reduced at the after end to 8 in. in thickness. The barbettes for the 16-in. guns are 18 in. thick, reduced to 9 in. where otherwise protected, thus appearing to be sufficiently provided for in the way of defence. The vessels are elsewhere practically unprotected by side armour, thus giving little cover to the personnel. There is, however, further additional protection to the funnel bases by means of inclined armour 9 in. in thickness extending to the upper deck. The control and director positions are apparently unprotected, whilst the systems of mast and tower construction outline the vessels conspicuously as targets, but may possibly make the danger of entire destruction of control by a single lucky shot less likely than in contemporary types. The horizontal protection against aerial and other attack consists of a deck or decks varying from 3 in. to 5 in. in thickness.

The propelling machinery is arranged for turbines with electric drive, and Babcock and Wilcox boilers.

## FRANCE.

### BRETAGNE—LORRAINE—PROVENCE.

Taking the French vessels, there is a complete water-line 10 $\frac{1}{2}$ -in. to 7-in. belt of considerable depth, and an armoured citadel 6 in. to 7 in. thick, extending to the upper deck, protecting the bases of some of the barbettes, and the principal auxiliary armament, thus providing a large amount of armoured stability, with reasonable protection for the personnel.

The ten 13.4-in. guns are in this case all twin mounted, and so arranged as to have four capable of firing direct ahead, and four direct astern, whilst all ten are capable of firing through large arcs on either broadside. This arrangement of the main guns, whilst more expensive in weight of armoured protection, reduces the risk of numerous guns being put out of action by a single shot, and forms a less provocative target of the nerve centres than the British, but demands a correspondingly larger volume of internal space.

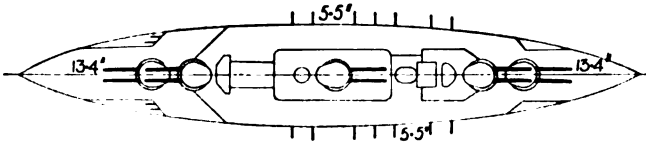
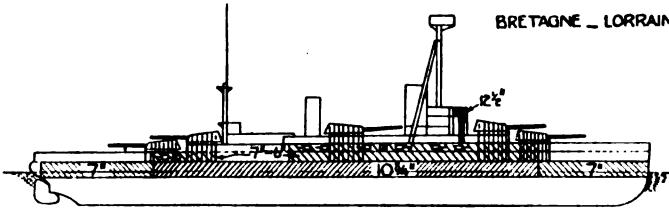
The maximum range of the 13.4-in. guns is given as 22,000 metres (with a maximum elevation of 23°), firing a projectile weighing about 1,300 lb.

The eighteen 5.5-in. guns of the main auxiliary armament are all mounted in the 7-in. and 6-in. main deck battery, which, whilst affording adequate protection to the guns and personnel, reduces their above-water height, and consequently their efficiency under certain sea conditions. The anti-aircraft equipment in this case consists solely of eight 3-in. and four 3-pdr. guns, showing the disparity which exists in the minds of the naval experts of the various maritime countries, as to what armament is really desirable for such equipment.

The calibre of the principal guns would appear to be on the small side, but perhaps sufficiently powerful if England, Japan, and the United States have been omitted from any offensive power calculation.

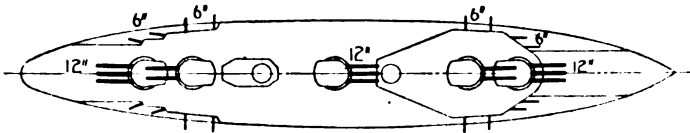
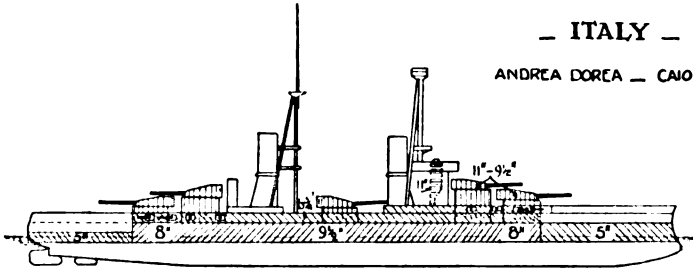
— FRANCE —

BRETAGNE — LORRAINE — PROVENCE



— ITALY —

ANDREA DOREA — CAIO DUILIO

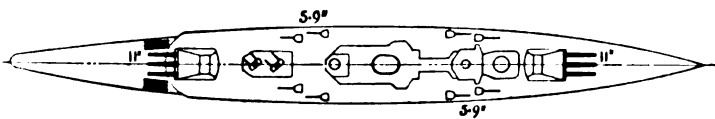
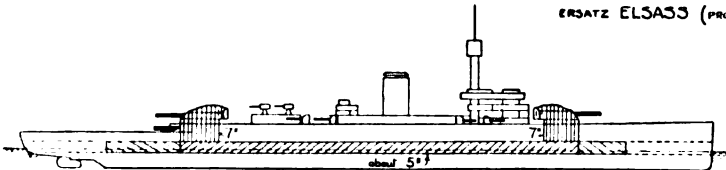


— GERMANY —

DEUTSCHLAND

ERSATZ LOTHRINGEN — ERSATZ BRAUNSCHWEIG

ERSATZ ELSSASS (PROJECTED)



The vessels are provided with four 18-in. broadside submerged torpedo tubes.

The barbettes are efficiently protected by armour of considerable thickness, and the control and other stations are not so obvious to the observer as in other types. The deck or horizontal protection appears to be patchy, and in some places inadequate for fighting units of such dimensions and requirements.

The propelling machinery is of the Parsons turbine type with installations of Niclausse and Belleville boilers respectively.

#### DUNKERQUE.

Some mention, perhaps, should be made of the French reply to the *Deutschland*, viz. the battle-cruiser *Dunkerque*, about to be laid down at Brest. On a displacement of 26,500 tons, there is an armament of eight 13-in. guns, quadruple mounted forward and aft, having a range of 37,000 yd. at an elevation of  $42^\circ$ , firing a projectile of approximately 1,000 lb.; the auxiliary armament consisting of eight 6-in. guns. The speed is given as 29 knots.

If the *Dunkerque* is designed purely as a reply to the *Deutschland* she is unnecessarily powerful; if for ordinary line of battle obviously too weak in armoured protection; whilst her unusual concentration of guns and magazines is likely to prove a menace to her own safety in case of a naval action or successful torpedo attack.

#### ITALY.

##### DUILIO—DORIA.

These vessels are fine examples of maximum water-line and above-water side armoured protection, combined with a reasonable armament and satisfactory speed, whilst the above-water profiles do not make them conspicuous as targets.

The main armament of thirteen 12-in. guns is arranged somewhat differently to the practice in other navies, the guns being carried in three triple and two twin turrets, giving a forward and aft fire of five 12-in. guns, whilst all the thirteen guns are arranged to train through large arcs on either broadside. The maximum range of the 12-in. guns is stated to be about 37,000 yd. (at a maximum elevation of about  $40^\circ$ ), firing a projectile weighing 850 lb. The principal auxiliary armament of sixteen 6-in. guns is arranged in the 6½-in. armoured citadels before referred to, and therefore well protected. The anti-aircraft equipment consists of sixteen 14-pdrs. The vessels are equipped with two 18-in. broadside submerged torpedo tubes.

The main water-line belt tapers from 9½ in. over the midship portion, to 5 in. and 3 in. at the ends, and runs throughout the length of the vessel. Above the belt a 6½-in. armoured side is carried from the forward to the after barrette bases, forming at the ends armoured citadels for the sixteen 6-in. guns, assisting also



in the protection of the barbette bases, the 9½-in. barbette armour being reduced in thickness where reinforced by same. This arrangement gives a maximum area of armoured protection to the vessels, including the armament and personnel, and a large margin of armoured stability. The horizontal protection is excellent, amounting in some parts to 6¾ in.

The propelling machinery includes Parsons turbines with small-tube Yarrow boilers.

## GERMANY.

### DEUTSCHLAND—LOTHRINGEN—BRAUNSCHWEIG—ELSASS.

Taking last the German ships, referred to generally as "pocket battleships," here we have a type which the naval world admits as ingenious, the vessels of which type to a very large extent fulfil the purpose for which they were designed. They cannot be looked upon as capital ships proper, but rather as battle units having the maximum offensive and defensive powers, with the greatest speed possible on an arbitrarily fixed displacement of 10,000 tons. Without agreeing to the hysterical claims made in some quarters for these vessels, it can be said with reasonable certainty that they need fear no attack from any of the existing 10,000 ton eggshell cruisers of any naval power, whilst their speed and radius of action would in ordinary conditions allow them to keep clear of battleship attack.

A special feature of the design is of course (in addition to the large amount of electric welding employed in the construction) the adoption of internal combustion machinery for propulsive purposes, which reduces weight and gives a greater radius of action on a given weight of fuel than is possible with any other type up to the present.

The armament is at first glance rather surprising on such a limited displacement; but similar vessels could, if desired, be built in this country using only the usual type machinery. The six 11-in. guns are triple mounted in barbettes, one at each end of the vessel; three guns fire direct forward and three direct aft, with large arcs of training on each broadside, the gun axes being a reasonable height above water. The maximum range of the 11-in. guns is stated to be 30,000 yd. (at a maximum elevation of 60°), firing a projectile of 670 lb. weight. The principal auxiliary armament consists of eight 5·9-in. guns, single mounted in thin armoured shields on the upper works, whilst the anti-aircraft equipment comprises four 8·4-in. A.A. guns.

The torpedo equipment consists of six above-water 20-in. torpedo tubes.

The armoured protection shows a narrow water-line belt reported as about 5 in. in thickness, extending from amidships over the bases of the 11-in. gun barbettes, continuing by short lengths of thinner armour forward and aft, but still leaving a fairly considerable length of unprotected water-line at the ends. The barbettes are protected by 7-in. armour, the horizontal protection

being completed by two protective decks of from  $1\frac{1}{2}$  in. to 5 in. in thickness. The whole of the protection, on the face of it, has been designed to deal with possible attacks from vessels of the cruiser type; the main armament has been arranged to attack and destroy such vessels at long distance, or in case of emergency to defend themselves from attack by capital ships.

The main objection to the design would appear to be deficient armoured stability, and the meagre amount of protection to the personnel.

These vessels are reported to be a big advance on anything afloat in the matter of anti-submarine and mine protection.

The propelling machinery consists of a complete installation of M.A.N. Diesel engines.

#### OBSERVATIONS AND DEDUCTIONS.

From the foregoing it will be evident that very large differences of opinion exist as to what is deemed necessary by the various naval authorities with respect to the vital constituent parts of capital units. In some cases, no doubt, the design has been limited in essentials by the state of the country's exchequer, in others arranged to meet possible opponents without reference to the larger battleships of Great Britain, the United States, and Japan.

It will be seen that the displacements vary from 33,500 to 10,000 tons, the speeds from 26 to 20 knots, the calibre of the guns of the main armament from 16-in. to 11-in., the guns of the secondary armament from 6-in. to 5-in., whilst the high angle A.A. guns range from 6-in. to 3-pdrs.

Belt and side protection armour ranges from, in certain types, practically covering three-quarters of the exposed above-water area, to that of a comparatively small area amidships, the water-line belts ranging in maximum thickness from 16 in. to 6 in., the side and citadel armour from 7 in. to practically the thickness of hull plating only. Barbette protection varies from 18 in. to 7 in., whilst in the case of the horizontal protection there are a multitude of variations, from a single armoured deck with patchy areas of maximum thickness, to double decks of practically uniform thickness, the variations ranging from  $6\frac{3}{4}$  in. to  $2\frac{1}{4}$  in.

With reference to propelling machinery, it will be seen that the types adopted vary considerably, from the complete Diesel installation of the German ships, to the turbine installations of the British, French, Italian, and Japanese, with water-tube boilers of large or small-tube type; and the electric drive with water-tube boilers of the United States type.

There is, however, a new high efficiency transmission of power element come into being, which has been very carefully thought out and worked out. It is likely to revolutionise the present propelling installations large and small, and whilst as a matter of convenience this may be referred to as electric drive, the installation differs so much in reduction of weight and space, and in ability to operate efficiently at all speeds without gearing or complication

that its adoption for all types of marine work is practically assured, and more will be heard of this at no distant date.

The foregoing particulars, as relating to the vessels themselves, are based on published particulars, and may be taken as fairly accurate, but it will be noticed that as a rule no definite information is given as to the internal arrangement of protection from submarines, mines, or other under-water attack. Since the Great War, notwithstanding the limitation of naval armaments, continuous and successful efforts have been made to render under-water attack more certain and more effective, and it may be taken as certain that the naval powers concerned are more or less aware of such progress in these nefarious branches of submarine warfare, and must of necessity in any capital ships building, or to be built, give due attention to the provision of efficient protection against each and every form of attack. In this connection account has to be taken of the latest increase in explosive capabilities; the speed, and radius of action of the latest torpedoes, even where the dimensions have not been increased; the devastating action of the latest mines; and the possibility of other destructive agents arranged to explode directly beneath a vessel under given conditions and circumstances.

It will be clear to all that even at the present time protection in some form or other for the above purpose is already provided in existing ships, and will be intensified in any new construction. Present methods against torpedo attack consist, generally speaking, in endeavouring to arrange to keep the centre of the under-water explosion as far away as possible from the vitals of the ship, and is effected in certain cases by fitting a bulge on the under-water part of the hull, reinforced by one or more longitudinal armoured bulkheads kept well in from the sides, extending from the bottom or double-bottom to the nearest above-water deck, and extending longitudinally, where possible, throughout the length of the machinery and magazines.

In other cases the bulge is omitted, but the armoured longitudinal bulkhead or bulkheads placed in what is calculated to be a more or less safe distance from the outside hull practically to insure the safety of the machinery and the magazines. This arrangement is again reinforced in some instances by fitting in the armoured deck certain areas, to which, in case of explosion, pressure yields, and so automatically reduces the pressure on the bulkheads themselves, the force of the explosion being thereby led into channels where it can effect least damage.

In the case of the Russian armoured cruiser *Rurik*, which the author had the honour of designing, and which was built by Vickers at Barrow, and acted as flagship in the Baltic during the War, one of the contract conditions was that if 50 ft. of the side below water were blown away, the vessel whilst sinking to a deeper draft to make up lost buoyancy, would not either alter heel or trim, and this condition was satisfactorily fulfilled.

It might be mentioned here that Professor Kriloff, one of the world's most famous naval architects, at one time President of the Naval Model Testing Tank in St. Petersburg, and later President of

the Marine Technical Committee (which had the final voice in any Russian warship), considered that effective subdivision of the space between the deck in the region of the water-line and the deck above, was a more effective way of dealing with gun or torpedo explosion, so as to render the vessel stable after same, than any attempt to provide against either by under-water protection, but agreed that when coupled with same it rendered the defence doubly efficient.

### THE FUTURE CAPITAL SHIP.

We now come to the question of a forecast as to the possible size and characteristics of a capital ship of the immediate future, taking into account the probable compulsory limitations due to mutually accepted conditions of "Disarmament" and other Conferences arranged for the purpose of formulating same. In the first place we must look to the weapons or instruments of attack likely to be employed against a capital unit, and the means taken to counteract same.

*Artillery and Armour.*—The present tendency appears to lie in the general direction of reducing the calibre but increasing the firing velocity of the guns, also increasing the weight of armour-piercing shells and bursting charges, so that taking everything into consideration it would seem that guns of 11-in. or 12-in. calibre will eventually be adopted by all the principal navies. It necessarily follows that naval battles can be fought at a useful maximum range of from 30,000 to 35,000 yd., where the destructive powers of artillery, whilst still effective, will be much reduced, and where a moderate side and barbette armour thickness, coupled with reasonable horizontal protection, should suffice for defence.

Against such attack a not less than 9-in. water-line belt extending throughout the midship part, continued over the barbette bases, and from below the water-line to the main deck, also continued at the forward end in graduated thicknesses to  $2\frac{1}{2}$  in. at the stem, and aft for about half the distance between the termination of the main belt and the extreme end to 4 in., would appear to be satisfactory, or as an alternative the ends to be minutely subdivided. Above the main belt the armoured side to be not less than 6 in. in thickness continued up to the height of the upper deck; at the ends of same to be carried to the height of the superstructure deck forming armoured citadels forward and aft for the auxiliary armament, the whole giving good armoured protection to the bases of the control systems, the lower parts of the barbettes, and the personnel.

The horizontal protection, in view of the danger from plunging shots when pursuing or avoiding an enemy, or from attack by bombing planes, should be of ample thickness, say, not less than a single or combined thickness of 5 in. over machinery, magazines, and steering gear, and not less than  $2\frac{1}{2}$  in. in the remaining parts.

*Torpedo Attack and Defence.*—The function of the torpedo becomes of more importance every year, and considering that at the present time the range of some torpedoes at the speed of 45 knots

extends to 15,000 yd., with a high explosive charge amounting in certain cases to 700 lb., the necessity of this arm for offence and the still greater necessity of providing adequate measures for its reception will be at once apparent.

The latest capital ships, whilst providing reasonable defence against attack, have the number of torpedo tubes reduced ; in some cases to a single pair. During the last War, with some actions when fought at comparatively short distances, the fluctuating depths and irregular movements of torpedoes immediately after their discharge and before running on their course at a regularly appointed depth, resulted in some of them passing completely underneath the vessel attacked, and continuing on their way leaving the vessel uninjured. Means have now been taken everywhere to avoid such occurrence in future actions. In future capital ships the torpedo equipment may be still further reduced or dispensed with, vessels of other types being more liberally supplied.

Against destruction from such attack some provision must naturally be made, and as previously mentioned some of the methods at present followed consist of an added below-water bulge and one or more longitudinal bulkheads, armoured or otherwise, the innermost being kept at a distance as far away as possible from the centre of explosion. In many cases the exterior bulge is not fitted, the longitudinal bulkheads being made correspondingly stronger.

In almost every case endeavours have been made to direct the force of such explosion in an upward and outward direction, in such way as to leave the vital parts above and below water practically intact. The fitting of torpedo netting is now obsolete.

*Mines, Offensive and Defensive.*—It is questionable whether capital ships should be arranged to carry a complement of mines ; the space taken up is fairly considerable, and the occasions and circumstances of utilising them few and far between. They are more easily and efficiently laid or distributed by other craft specially designed for that purpose. Notwithstanding this there is no doubt that in some cases they will be arranged for.

Defence against mines, whilst in some respects provided for by provision against torpedo attack, must be supplemented by other means such as paravanes, which when a vessel is in the neighbourhood of a mine field, are arranged to be towed from the bows of a vessel at a given depth below the water, spreading out horizontally at a predetermined angle, having at their extremities automatic cutters of great power. The progress of the vessel automatically runs the horizontal cable of the paravane along the vertical cable of the fixed mine until at the full length of the paravane cable the cable of the fixed mine is severed, allowing the mine to rise to the surface, where it can be destroyed by gunfire, or where after a short period afloat it sinks to the bottom and is no longer a menace.

In addition to the before-mentioned mines, others are arranged to vary the depth at which they are capable of operating, so whilst at one time they may be at a depth of 10 ft. or 12 ft. below the surface, and so could be dealt with by paravanes, at other times they are capable of rising under the bottom of any vessel, creating

widespread damage. To meet this latter situation in some instances the depth of the double-bottom in way of the engine and boiler rooms has been practically doubled, and the double and outer bottom plating very materially increased in thickness, but as the possibility of disaster from such causes is remote, and as such arrangement increases considerably the depth of the vessel and raises the height of the machinery and boilers, it is questionable whether it is desirable or even effective.

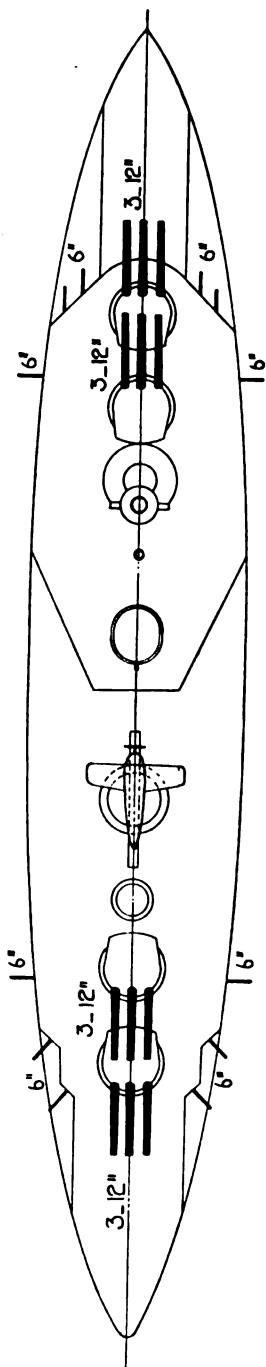
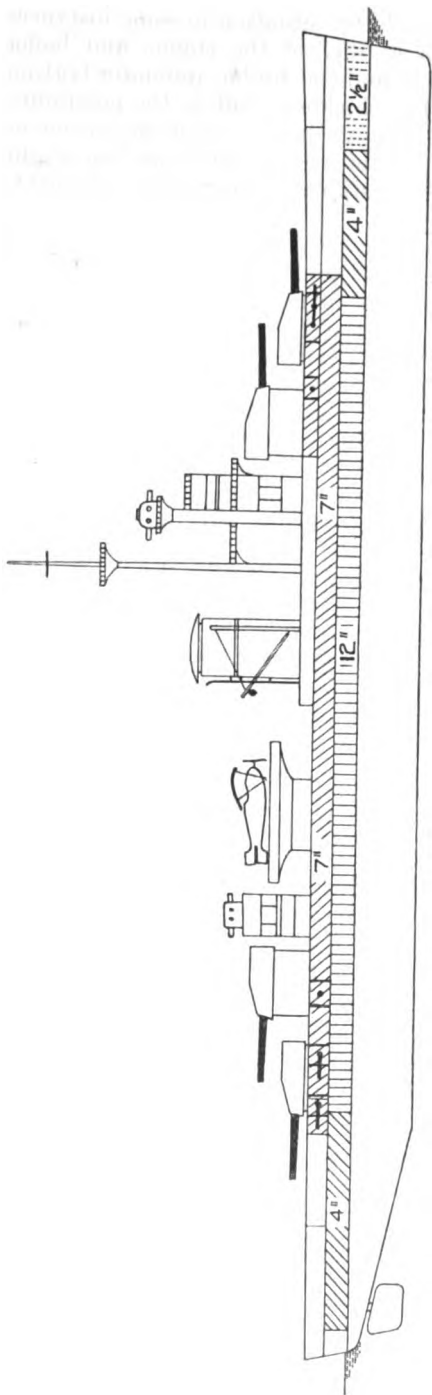
*Aircraft.*—Some of the present capital ships are arranged for carrying and launching seaplanes, but such equipment can only be considered as for scouting purposes, and not as a destructive arm, although in certain cases may be used for bomb-dropping where circumstances are favourable. Whilst capital ships, therefore, cannot in any way be considered as equipped with seaplanes for offensive purposes, provision on the other hand has to be, or should be, made for protection against such, and in this respect the horizontal protection already referred to in the case of plunging shot applies, perhaps even to a greater extent, whilst not forgetting that quite useful torpedoes are now borne by such planes, carrying within them elements of considerable danger; but this point is already taken care of in the arrangement of protection against ordinary torpedo attack.

*General Characteristics.*—This brings us to the stage where the possible characteristics of the capital ship of the immediate future may be envisaged and outlined. The armament of 12-in. guns, probably twelve in number, to be triple mounted forward and aft, so arranged as to have two of the four barbettes raised somewhat, in order that six guns may fire direct ahead, and six guns direct astern, with a broadside fire of twelve 12-in. guns. The barbettes to be of armour 14-in. thick, reduced where reinforced by 7-in. armoured side and citadel.

The auxiliary armament to consist of twelve 6-in. guns mounted in a 7-in. upper-deck armoured citadel, four at least of these guns to be arranged to fire direct ahead and four astern, with six on each broadside; as an alternative, if extra rapid loading is considered desirable, these could be twin mounted in armoured shields as in the Nelson. To carry at least eight anti-aircraft guns, preferably 4·7-in. or 4-in., mounted on the upper works, and two 21-in. to 24-in. torpedo tubes, also a complement of seaplanes with launching apparatus, and possibly a mine and depth charge equipment.

The side protection to consist of a 12-in. water-line belt, from below water, tapering in thickness to the main deck with 7-in. armour above to height of upper deck complete with a raised 7-in. gun citadel. Water-line belt to continue right forward, tapering to 2½ in., the water-line belt aft to be carried almost to the extremity 4 in. in thickness, extending to height of main deck both fore and aft. A 16-in. conning tower to be fitted.

Horizontal protection to consist of two armoured decks in way of machinery, magazines and barbettes, of a combined thickness of not less than 6 in. Outside this area to be 3 in. thick with 6 in. over the steering-gear compartment. The under-water protection



# PROPOSED FUTURE CAPITAL SHIP.

Length, 580 ft. ; displacement, 25,000 tons ; sea speed, 22 knots ; armament, twelve 12-in. guns, twelve 6-in. guns, eight 4.7-in. A.A. guns, and two 21-in. or 24-in. torpedo tubes.

against submarines and mines to consist of a slight swelling out or "bulge" incorporated in the vessel's structure, with at least two longitudinal bulkheads, one armoured; one placed about midway between the shell and the inner bulkhead, which latter should be kept as far from the side as machinery and magazine arrangements will allow.

Provision to be made by means of which in case of serious damage to the under-water part of the vessel at any part of its length, water will be admitted automatically to other compensating compartments, counteracting in a short period of time any alteration, heel or trim occasioned by such damage. The double-bottom plating to be increased in thickness under the engines, boilers and magazines, the double-bottom itself to as deep as the design will allow.

The propelling machinery to consist of geared turbines with small-tube water-tube boilers.

The fire-control, range-finding, spotting and other installations to be so arranged as to form the least possible targets, and to be duplicated where possible.

The capital ship described above can be arranged on a displacement of 25,000 tons.

In order to maintain a constant sea speed, length is important, so taking the length as 560 ft. the dimensions and sea speed can be assumed approximately as follows:—

Length . . . . .	560 ft. 0 in.
Breadth . . . . .	92 ft. 0 in.
Mean draft . . . . .	29 ft. 6 in.
Displacement (in tons) . . . . .	25,000.
H.P. . . . .	30,000.
Speed at sea . . . . .	22 knots.

Such vessel in appearance and arrangement would closely resemble the existing capital ships of Italy, namely, the *Duilio* and *Doria*, but owing to no central barbette being carried, there is a clearer superstructure deck, allowing a better arrangement of controls. She has also immensely superior armoured protection, while against the loss of fire of one 12-in gun on the broadside, there is the gain of one additional gun in forward and after fire. It will probably be some considerable time before another capital ship is laid down in this country, and many things may occur to affect or modify the present position and ideas as to design.

The object of this article is to bring together the particulars of present-day types, to examine the apparent strength or weakness of certain features of same, and to suggest a possible type under unknown limitations. It may be that the comparisons together with the suggestions given may lead to a greater interest in the construction and future of this great arm of warfare, considered in certain circles as now becoming obsolete, but which, on the whole, has every appearance of still maintaining its hitherto paramount power.

GEORGE THURSTON.





# MERCHANT SHIPPING SECTION.



## CHAPTER VII.

### STANDING OF THE WORLD'S MERCHANT FLEETS.

THE general slowing down of shipbuilding construction and a more vigorous policy of scrapping tonnage have combined to stem the normally progressive increase of the merchant fleet of the world. The large amount of tonnage lying idle, estimated in the autumn to reach the enormous total of 18½ million tons, is eloquent of the lack of demand for overseas transport. The long-continued shipping depression and uncertainty concerning the future have put a brake on that form of enterprise which finds its outlet in the building of new ships. The great wave of constructional activity found expression particularly during the years 1918-1921. For the last two years such work as has come to the shipyards has consisted mainly of oil tankers. At one time these represented as much as 40 per cent. of the tonnage building, and even last autumn, with the shipbuilding industry labouring under the acutest depression in modern history, the tankers accounted for 24 per cent. of the work in hand throughout the world. Bearing in mind the number of ships of special types and some large passenger liners which were also building, it will be obvious that the amount of general cargo tonnage turned out during the last two years has been relatively small.

Figures in Table I, giving the tonnage owned throughout the

TABLE I.—TONNAGE OF THE WORLD.

Year.	Steam and Motor.		Sail.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.
1913	23,897	43,079,177	6,694	3,890,936	30,591	46,970,113
1914	24,444	45,403,877	6,392	3,685,675	30,836	49,089,552
1915	24,508	45,729,208	6,212	3,532,561	30,720	49,261,769
1916	24,132	45,247,724	6,035	3,435,412	30,167	48,683,136
1919	24,386	47,897,407	4,869	3,021,866	29,255	50,919,273
1920	26,513	53,904,688	5,082	3,409,377	31,595	57,314,065
1921	28,433	58,846,325	4,773	3,128,328	33,206	61,974,653
1922	29,255	61,342,952	4,680	3,027,834	33,935	64,370,786
1923	29,246	62,335,373	4,261	2,830,865	33,507	65,166,238
1924	29,024	61,514,140	3,932	2,509,427	32,956	64,023,567
1925	29,205	62,380,376	3,711	2,261,042	32,916	64,641,418
1926	29,092	62,671,937	3,523	2,112,433	32,615	64,784,370
1927	28,967	63,267,302	3,205	1,925,608	32,175	65,192,910
1928	29,387	65,169,413	3,021	1,795,246	32,405	66,954,659
1929	29,612	66,407,393	2,870	1,666,919	32,482	68,074,312
1930	29,996	68,023,804	2,717	1,583,840	32,713	69,607,644
1931	29,952	68,722,801	2,392	1,408,239	32,344	70,131,040
1932	29,932	68,368,141	2,315	1,366,169	32,247	69,734,310

Owing to the War, statistics were not compiled regarding the vessels recorded in Lloyd's Register Books for the years 1917 and 1918. Tonnage figures for sailing vessels prior to 1919 are net tons; otherwise all tonnages are gross tons.

world, compiled from Lloyd's Register, show that during the year ended June, 1932, the last period for which complete statistics are available, there was a net decrease of 896,780 tons compared with a net increase during the preceding year of 523,896 tons. There was, during the year, a decrease of 961,604 tons in steam tonnage, a decrease of 42,070 tons in sail tonnage, and an increase of 606,944 tons in motor tonnage. The tonnage of motorships has progressively increased in its short history of about twenty years.

In the figures for individual countries (Table II) net increases

TABLE II.—TONNAGE OWNED BY PRINCIPAL MARITIME COUNTRIES.  
(In thousands of tons, '000 omitted.)

	Great Britain and Ireland.	United States (Sea-going).	Japan.	Germany.	Italy.	France.
1914	19,257	2,970	1,708	5,459	1,668	2,319
1919	16,555	10,782	2,325	3,503	1,370	2,234
1920	18,330	13,790	2,996	673	2,242	3,245
1921	19,571	14,697	3,355	717	2,651	3,652
1922	19,296	14,738	3,587	1,887	2,866	3,846
1923	19,281	14,597	3,604	2,590	3,034	3,737
1924	19,106	13,530	3,843	2,954	2,832	3,498
1925	19,441	12,949	3,920	3,074	3,029	3,512
1926	19,400	12,365	3,968	3,111	3,241	3,490
1927	19,309	12,070	4,033	3,363	3,483	3,470
1928	19,875	11,997	4,140	3,777	3,429	3,344
1929	20,166	11,835	4,187	4,093	3,285	3,379
1930	20,438	11,388	4,317	4,229	3,331	3,531
1931	20,303	10,999	4,276	4,255	3,336	3,566
1932	19,672	10,889	4,255	4,165	3,391	3,557

	Norway.	Holland.	Sweden.	Spain.	Denmark.	Total all Nations.
1914	2,505	1,496	1,118	899	820	49,089
1919	1,858	1,592	993	751	702	50,919
1920	2,219	1,793	1,073	997	803	57,314
1921	2,584	2,226	1,160	1,165	964	61,975
1922	2,601	2,633	1,115	1,283	1,038	64,371
1923	2,552	2,626	1,208	1,260	997	65,166
1924	2,505	2,556	1,254	1,240	1,036	64,024
1925	2,680	2,601	1,301	1,185	1,060	64,641
1926	2,842	2,565	1,338	1,163	1,081	64,784
1927	2,824	2,654	1,365	1,162	1,060	65,193
1928	2,968	2,817	1,447	1,164	1,068	66,955
1929	3,324	2,939	1,510	1,162	1,056	68,074
1930	3,668	3,066	1,624	1,232	1,088	69,608
1931	4,066	3,118	1,705	1,227	1,145	70,131
1932	4,167	2,964	1,716	1,265	1,181	69,734

were recorded last year in Norway (101,333 tons), Danzig (82,355 tons), Soviet Russia (81,308 tons), Greece (72,282 tons), and Italy (54,899 tons). The principal decreases were in Great Britain and Ireland (631,230 tons), Holland (154,330 tons), the United States (95,563 tons), and Germany (89,759 tons). The Norwegian increase is due to the large number of oil tankers which have been building

for registration under the Norwegian flag; the figures in Table III are eloquent of this development. The Italian mercantile marine

TABLE III.—PROPORTION OF TANKERS IN THE NORWEGIAN MERCANTILE MARINE.

Year.	Tankers.		Total Mercantile Marine.		Percentage Tanker Tonnage.
	No.	Gross Tons.	No.	Gross Tons.	
1932	217	1,539,384	2,008	4,166,839	37
1931	204	1,450,470	1,990	4,065,506	36
1930	154	1,059,550	1,916	3,668,289	29
1929	117	781,575	1,807	3,224,493	24
1928	88	564,210	1,787	2,968,207	19
1927	63	403,812	1,806	2,824,225	14
1926	54	343,582	1,844	2,841,905	12

has progressed mainly because of the construction of a number of large passenger ships. The Rex and Conte di Savoia, for example, account, between them, for no less than 100,000 gross tons. Not all the increases, however, represent new construction. Greece, for example, is a large purchaser of second-hand tonnage, and part of her increase is probably due to the transfer of British ships to the Greek flag.

It will be observed from Table II that the tonnage owned in Great Britain and Ireland has declined during the last three years, and is only 415,000 tons greater than it was just before the War. So far as ordinary cargo and passenger vessels are concerned, however, the figure is considerably below the 1914 total, because the tonnage of oil tankers now owned in this country is 2,816,000 tons. Twelve per cent. of the British total now consists of such tonnage, a proportion exceeded by only two other countries, the United States with 23 per cent. and Norway with 37 per cent. The influence of the tanker building programmes is also shown in Tables IV and V.

TABLE IV.—PROPORTION OF SHIPBUILDING CONSTRUCTION ABSORBED BY OIL TANKERS.

	Oil Tankers.	Total Shipbuilding.	Percentage Tankers.
Jan. 1, 1922 . . . . .	793,193	4,457,393	18
" 1923 . . . . .	300,128	2,954,318	10
" 1924 . . . . .	175,164	2,444,336	7
" 1925 . . . . .	309,270	2,470,436	12
" 1926 . . . . .	308,439	2,069,545	15
" 1927 . . . . .	371,520	1,933,027	19
" 1928 . . . . .	744,668	3,118,721	24
" 1929 . . . . .	361,972	2,618,001	14
" 1930 . . . . .	627,756	3,110,880	20
" 1931 . . . . .	907,298	2,326,086	39
" 1932 . . . . .	351,320	1,403,795	25

Sailing ship tonnage shows a progressive decline and barely reaches 2 per cent. of the world total to-day. Ten years ago it amounted to nearly 5 per cent., and to over 8 per cent. in 1914.

The United States is the largest individual owner with 726,000 tons (over half) of the present total of 1,866,000 tons, Great Britain coming next with 110,000 tons, Canada with 89,000 tons, Finland with 70,000 tons, Italy with 59,000 tons, and France with 49,000 tons. Excluding, however, small craft which, because not self-

TABLE V.—PERCENTAGE OF TANKERS TO TOTAL WORLD TONNAGE  
(SAIL EXCLUDED).

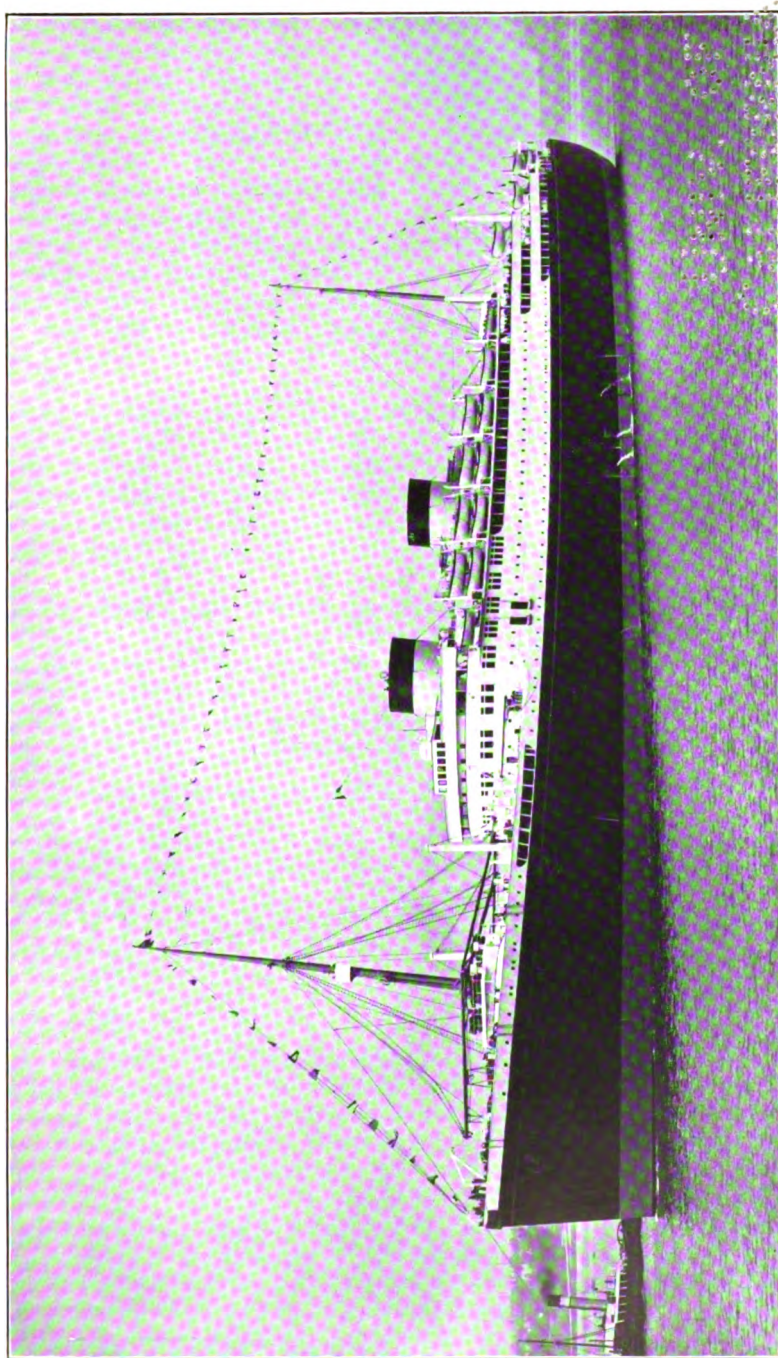
	Total World Tonnage (Sail excluded).	Tankers.	Percentage Tankers.
	Gross Tons.	Gross Tons.	
1914 . . . . .	45,404,000	1,479,000	3
1919 . . . . .	47,897,000	2,929,000	6
1920 . . . . .	53,905,000	3,354,000	6
1921 . . . . .	58,846,000	4,419,000	8
1926 . . . . .	62,672,000	5,665,000	9
1928 . . . . .	65,159,000	6,620,000	10
1929 . . . . .	66,407,000	7,071,000	11
1930 . . . . .	68,024,000	7,628,000	11
1931 . . . . .	68,723,000	8,660,000	13
1932 . . . . .	68,368,000	8,911,000	13

propelled, are classed as sailing ships, the world total is only 631,000 tons, of which 200,000 tons (31·7 per cent.) are owned in the United States, 70,000 tons in Finland, and 15,000 tons in Great Britain. There are now only twelve sailing ships of between 3,000 and 3,400 tons gross each.

For general statistical comparisons, therefore, it is convenient to ignore sailing ship tonnage, and the changes in the mercantile marines of the world from 1914 to 1932 are indicated in Table VI, which sets out the steam and motor tonnage of the world at these

TABLE VI.—COMPARISON OF STEAM AND MOTOR TONNAGE AT JUNE, 1914; JUNE, 1923; AND JUNE, 1932, AS RECORDED IN LLOYD'S REGISTER BOOK.

Countries.	1914.	1923.	1932.	Difference between	
				1923 and 1914.	1932 and 1923.
	Gross Tons.	Gross Tons.	Gross Tons.	Gross Tons.	Gross Tons.
Great Britain and Ireland . . .	18,892,000	19,115,000	19,562,000	+ 223,000	+ 447,000
British Dominions . . .	1,632,000	2,580,000	2,970,000	+ 948,000	+ 390,000
Denmark . . . .	770,000	938,000	1,171,000	+ 168,000	+ 233,000
France . . . . .	1,922,000	3,453,000	3,508,000	+ 1,531,000	+ 55,000
Germany . . . .	5,135,000	2,510,000	4,143,000	- 2,625,000	+ 1,633,000
Greece . . . . .	821,000	747,000	1,470,000	- 74,000	+ 723,000
Holland . . . .	1,472,000	2,607,000	2,957,000	+ 1,135,000	+ 350,000
Italy . . . . .	1,430,000	2,881,000	3,331,000	+ 1,451,000	+ 450,000
Japan . . . . .	1,708,000	3,604,000	4,255,000	+ 1,896,000	+ 651,000
Norway . . . . .	1,957,000	2,376,000	4,164,000	+ 419,000	+ 1,788,000
Spain . . . . .	884,000	1,199,000	1,250,000	+ 315,000	+ 51,000
Sweden . . . . .	1,015,000	1,136,000	1,691,000	+ 121,000	+ 555,000
United States (Sea)	2,027,000	13,426,000	10,270,000	+ 11,399,000	- 3,156,000
„ (Lakes)	2,260,000	2,197,000	2,445,000	- 63,000	+ 248,000
Other Countries	3,479,000	3,566,000	5,181,000	+ 87,000	+ 1,615,000
Totals . . . .	45,404,000	62,335,000	68,368,000	+ 16,931,000	+ 6,033,000



WHITE STAR LINE'S GEORGIC.  
(Builders, Messrs. Harland & Wolff, Belfast.)



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two dates and also in 1923. This table, like most of the others, is compiled from Lloyd's Register, and it shows that between June, 1914, and June, 1923, the net increase was 16,931,000 tons, or 37 per cent. increase on 1914. This addition was made, as has already been remarked, between 1918 and 1923, and includes the replacement of a large volume of tonnage lost during the War. Indeed, between the years 1918 and 1921 the shipyards were turning out record numbers of ships, the peak being reached in 1919 with an output of no fewer than 2,483 ships, of 7,145,000 tons. Of late the output has amounted to less than two million tons a year. During the last nine years the yearly increase of world tonnage has been only about 1 per cent., the gross addition in the same period being under 10 per cent. The principal changes are indicated in the Table.

Between 1914 and 1923 the shipping of the United States increased by 11,399,000 tons, but has declined by 3,156,000 in the last nine years. During the same respective periods, Germany converted a net deficit of 2,625,000 tons to an increase of 1,633,000 tons, and Norway during the last nine years, mainly for reasons already stated, has added 1,788,000 tons, the greater part since 1929.

Great Britain and Ireland have increased their fleets by only 670,000 tons (3·5 per cent.), whereas the aggregate increase of tonnage owned in other countries is more than 84 per cent. of the pre-War tonnage owned abroad. The striking variations in the proportions held by the principal maritime countries are shown in Table VII, where the comparison has been carried back thirty-six

TABLE VII.—PERCENTAGE OF TONNAGE OWNED TO-DAY COMPARED WITH 1914 AND 1896.

	1896. per cent.	1914. per cent.	1932. per cent.
Great Britain and Ireland . . . . .	56·0	41·6	23·6
United States (Sea). . . . .	4·0	4·5	15·0
Japan . . . . .	1·9	3·8	6·2
Norway . . . . .	3·0	4·3	6·1
Germany. . . . .	8·1	11·3	6·1
France . . . . .	5·2	4·2	5·1
Italy . . . . .	2·0	3·1	4·9
Holland . . . . .	1·8	3·2	4·3

years. France, it will be noticed, is the only foreign country showing a decrease over the whole period.

There has been a considerable increase in the size of sea-going steamers and motorships. While there were 3,608 of 4,000 tons or more in 1914, there are now 5,565, of which 489 are of 10,000 tons and above. Of these 489 vessels 234 are under the British flag. Rather more than 16·2 per cent. of the steam and motor tonnage (3,561 vessels) is less than five years old, and 9,048 vessels in Lloyd's Register are twenty-five or more years old. Twenty per cent. of the tonnage owned in Great Britain and Ireland is less than five years old, the only other countries with a larger proportion being Norway (32·4 per cent.), Holland (23·2 per cent.), and Denmark (21·2 per cent.). Countries with low percentages are Japan 13·4, Italy 11·9, U.S.A. (sea-going) 6·6, and Greece 2 per cent. respectively.

After this survey of the mercantile marine as a whole the larger types of vessels suitable for ocean-going purposes may be discussed. For this purpose oil tankers, fishing vessels, tugs, and river craft are excluded, and there must be deducted vessels on the Great Lakes, wood or composite ships, vessels of less than 4,000 gross tons and, with a few exceptions, those over twenty-five years old. Figures are then obtained as in Table VIII. On this basis the British

TABLE VIII.—TONNAGE OF OCEAN-GOING STEAMERS AND MOTORSHIPS AVAILABLE FOR GENERAL CARGO AND PASSENGER PURPOSES COMPARED WITH TOTAL STEAMERS AND MOTORSHIPS (JUNE, 1932).

Countries.	Total Steam and Motor Tonnage.		Ocean-going Tonnage.	
	Tonnage Owned.	Percentage of World Total.	Tonnage Owned.	Percentage of World Total.
Great Britain and Ireland . . . . .	19,562,143	28.61	12,482,849	38.49
United States . . . . .	12,820,150	18.75	5,759,868	17.76
Germany . . . . .	4,142,920	6.06	2,342,254	7.22
Japan . . . . .	4,255,014	6.22	2,053,446	6.33
France . . . . .	3,507,525	5.13	1,941,388	5.99
Holland . . . . .	2,957,195	4.33	1,774,775	5.47
Italy . . . . .	3,331,304	4.87	1,767,299	5.45
Norway . . . . .	4,163,836	6.09	1,024,579	3.16
Other Countries . . . . .	13,628,054	19.94	3,288,719	10.13
World totals . . . . .	68,368,141	100.00	32,435,177	100.00

proportion comes out as high as 38.5 per cent. Holland and Germany show an improvement, but Norway a considerable drop. The Norwegian change is due to the oil tanker issue which has already been discussed. Figures drawn up on broader lines, showing the tonnage for carrying goods and passengers, are given in Table IX. These are not confined to the larger ocean-going

TABLE IX.—TONNAGE AVAILABLE FOR CARRYING GOODS AND PASSENGERS.

	Gross Tons.	Gross Tons.
Total Tonnage of the World . . . . .	—	69,734,310
Sailing Ships . . . . .	1,366,169	
Oil Tankers, 1,000 tons and over . . . . .	8,808,821	
Oil Tankers, under 1,000 tons . . . . .	102,437	
Trawlers and other Fishing Vessels . . . . .	1,032,152	
Tugs and Salvage Vessels . . . . .	397,087	
Steam Barges and Dredgers . . . . .	939,045	
Paddle Steamers . . . . .	287,000	
Lake vessels, U.S.A. . . . .	2,552,532	
Lake vessels, Canada . . . . .	433,246	
		15,918,489
Steam and Motor Tonnage available for goods and passengers . . . . .	53,815,821	
Comparative figure for 1931 . . . . .	54,597,403	
" " " 1930 . . . . .	55,067,368	
" " " 1929 . . . . .	54,080,656	
" " " 1928 . . . . .	53,332,592	
" " " 1927 . . . . .	52,182,481	

type as in Table VIII. The basis on which the Table has been drawn up is indicated in the analysis.

Figures are given in Table X showing the variations which have occurred during the last eighteen years in the use of coal and oil as

TABLE X.—PERCENTAGE OF TONNAGE FITTED FOR EMPLOYING OIL OR COAL AND PERCENTAGE OF SAILING SHIPS TO THE GRAND TOTAL.

	Percentage of Total Gross Tonnage.					
	1914.	1922.	1929.	1930.	1931.	1932.
Sailing vessels and sea-going barges . . . . .	8.06	4.70	2.45	2.27	2.01	1.96
Oil, etc., in internal combustion engines . . . . .	0.45	2.35	9.73	11.63	13.45	14.40
Oil fuel for boilers . . . . .	2.65	22.34	28.53	28.53	28.52	28.87
Coal . . . . .	88.84	70.61	59.29	57.57	56.02	54.77
	100.00	100.00	100.00	100.00	100.00	100.00

fuel. Some interesting statistics bearing on the oil-fuel development were given in the annual report of Lloyd's Register, and were embodied, without comment, in a table giving an analysis of the types of machinery in vessels classed year by year by the Society. They seem to have escaped general notice, but they are very significant as indicating in the near future an even greater decrease in the proportion of coal-burning ships. The figures in Table XI

TABLE XI.—PERCENTAGE OF COAL AND OIL-BURNING SHIPS BUILT TO LLOYD'S REGISTER CLASSIFICATION DURING THE YEARS STATED.

	Coal.	Oil.
1918-19 . . . . .	66.2	33.8
1924-25 . . . . .	51.2	48.8
1926-27 . . . . .	30.8	69.2
1928-29 . . . . .	34.5	65.5
1930-31 . . . . .	18.3	81.7
1931-32 . . . . .	6.2	93.8

show the trend of the change. Under oil-burning are included motorships and steamers fitted for burning oil fuel whether, in fact, all the latter actually do so or not. A probable explanation of the remarkable change in the last two years is the high proportion of tankers built, most of them being motorships, and also the number of large liners constructed in the last two years, which, if not motorships, are almost exclusively oil-burning steamers. The lack of new coal-burning tramp tonnage is consequently reflected in the figures.

It has already been stated that motorship tonnage is the only class showing a progressive increase. During the last two years the tanker building boom has helped considerably. Out of 8,808,821 tons of tankers of 1,000 gross tons and upwards no less than 3,346,690 tons are motorships. In 1926 the proportion was only 600,000 tons out of 5,598,000 tons.

Considerable variations are also shown in the types of steam engines. In 1914 the turbine tonnage totalled only 730,000 tons. To-day, including ships fitted with a combination of steam turbines and reciprocating engines, the figure has reached 11,000,000 tons. During the year ended June 30, 1932, the tonnage of ships fitted

with steam turbines increased by 366,000 tons, whereas the tonnage of steamers fitted solely with reciprocating steam engines showed the remarkable decrease of 1,326,000 tons. Last year the motor-ship increase was 606,944 tons, the steady progress which it makes being indicated in Table XII.

TABLE XII.—NUMBER AND GROSS TONNAGE OF MOTORSHIPS.

Lloyd's Register Book.	Motorships (including Auxiliary Vessels).	
	No.	Gross Tons.
July, 1914 . . . .	297	234,287
" 1919 . . . .	912	752,606
" 1920 . . . .	1,178	955,810
" 1921 . . . .	1,472	1,248,800
" 1922 . . . .	1,620	1,542,160
" 1923 . . . .	1,795	1,666,385
" 1924 . . . .	1,950	1,975,798
" 1925 . . . .	2,145	2,714,073
" 1926 . . . .	2,343	3,493,284
" 1927 . . . .	2,552	4,270,824
" 1928 . . . .	2,933	5,432,302
" 1929 . . . .	3,246	6,628,102
" 1930 . . . .	3,696	8,096,337
" 1931 . . . .	4,080	9,431,433
" 1932 . . . .	4,420	10,038,377

The presence of so many idle ships has been one of the greatest problems which both owners and builders have had to face, and during last year figures showing this aspect of the shipping slump indicated the appalling shrinkage of international transport. It is not possible to gauge how the present slump compares with other shipping depressions because, during the earlier ones, the compilation of statistics had not been brought up to the present state of efficiency. Indeed, it is only during the last two or three years that an international survey has become possible, since, with a few exceptions, no figures were available of the tonnage idle in various Continental countries. The Chamber of Shipping's figures of laid-up tonnage go back about ten years. American figures go back nearly as far, since the United States authorities are exceptionally keen on the production of statistics, and the reawakening of interest there in overseas shipping problems brought with it as a natural accompaniment the collection of returns relating to the subject.

There is little doubt that, during the greater part of 1932, there were laid up throughout the world something like 13½ million tons, and many speculations have been made as to the real economic value of these ships. It has been suggested on a broad survey that about a third of the tonnage is obsolete—a sweeping generalisation which is difficult to define with particularity. If based roughly on the age of the ships, then the assertion is liable to fail, since very many recently built ships are unequal to the competitive strain of to-day. Striking evidence to this effect is to be found in the decision of the United States Shipping Board to scrap 124 vessels. An

TABLE XIII.—SIZE AND AGE OF TONNAGE OWNED IN GREAT BRITAIN AND IRELAND COMPARED WITH BRITISH TONNAGE LAID UP.  
(The laid-up tonnage is shown in italic figures.)

Divisions of Tonnage.	Divisions of Age.										Percentage laid up.			
	Under 5 years.		5 and under 10 years.		10 and under 15 years.		15 and under 20 years.		20 and under 25 years.			25 years and over.		
	No.	Gross Tons.	No.	Gross Tons.	No.	Gross Tons.	No.	Gross Tons.	No.	Gross Tons.				
100 and under	500	360	101,392	222	61,447	431	118,506	678	159,438	381	90,272	1,258	262,102	2.3
500	"	82	1,200	2	600	15	5,000	3	1,200	6	2,000	26	7,900	
"	1,000	82	63,776	125	93,001	143	103,991	69	50,540	74	53,894	169	118,326	8.5
"	2,000	73	2,900	8	6,600	22	17,200	4	3,500	5	4,000	9	6,900	
"	"	73	107,501	138	204,093	159	241,022	89	123,044	99	144,216	131	179,121	
"	"	7	9,000	20	31,000	25	39,300	11	17,500	16	22,000	20	28,600	14.8
"	4,000	111	341,490	168	503,398	146	415,526	93	286,249	79	253,593	106	319,811	
"	"	21	67,200	26	75,100	33	102,000	32	106,100	13	44,500	26	90,500	
"	6,000	311	1,532,283	254	1,265,803	325	1,701,451	163	813,745	128	631,439	64	302,269	
"	"	44	211,000	26	127,900	104	533,300	63	308,300	24	116,400	19	86,900	22.9
"	8,000	94	645,920	119	834,214	168	1,171,588	99	688,620	53	364,967	12	82,125	
"	"	15	100,100	30	210,200	35	241,600	22	148,800	9	61,000	12	13,600	22.2
"	10,000	47	409,727	29	257,106	65	568,921	31	271,086	14	120,188	3	114,409	
"	"	8	71,000	4	35,800	16	142,800	12	105,700	5	40,700	2	18,100	20.5
"	15,000	26	305,949	29	345,632	36	448,497	15	188,140	24	276,146	5	64,486	
"	"	1	10,200	3	36,600	3	38,200	4	48,700	2	26,900	1	12,400	23.7
"	20,000	8	143,849	16	271,487	19	324,178	6	98,635	1	18,866	—	—	10.6
"	"	—	—	1	18,900	2	31,300	4	68,000	—	—	—	—	
"	20,000 and above	12	289,253	11	230,380	3	112,489	3	94,612	2	98,665	3	79,259	13.8
"	"	—	—	—	—	—	—	—	—	—	—	—	—	
Total	.	1,124	3,941,140	1,111	4,066,561	1,495	5,206,169	1,246	2,774,119	855	2,052,246	1,701	1,521,908	
"	.	104	472,600	119	542,700	255	1,150,700	155	807,200	80	317,500	105	264,900	
Percentage laid up	.		12.0	13.3	13.3	22.1	22.1	29.1	29.1	15.5	15.5	17.4	17.4	18.2

examination of the list shows that only one was a really old vessel—thirty years old—the whole of the others having been built during the three years 1918–1920. In other words, these obsolete ships are far from reaching the twenty years or more commonly accepted as the age of senescence. At the time of writing the Shipping Board has still 143 vessels idle, and, presumably, in the category of the ships to be broken up, so that it has been saddled with 267 idle vessels out of 366. In this formidable total there is no doubt an exceptionally heavy proportion of ships less than fourteen years old which have been found incapable of employment. The date of their construction and the unusual conditions which brought them into being certainly place the American tonnage in a peculiar position. Many other countries were gaining their shipping and shipbuilding experience about the same time, and various units of their fleets must, for similar reasons, be unsuitable to-day. It would be idle to assume that all modern ships are better fitted to stand up to competition than the old ones, and the experience of some of the most astute shipping managements has shown that many other considerations surround the profitable operation of shipping under present-day conditions. An analysis made by the Chamber of Shipping of the size and age of British ships laid up compared with the totals owned in the respective categories is shown in Table XIII,

TABLE XIV.—GERMAN-OWNED TONNAGE (LLOYD'S REGISTER, JULY 3) COMPARED WITH LAID-UP TONNAGE OWNED BY MEMBERS OF THE VERBAND DEUTSCHER REEDER. OCT. 1, 1932.

Divisions of Tonnage.	Tonnage owned.		Tonnage laid up.	
	No.	Gross Tons.	No.	Gross Tons.
100 and under 500 . . . . .	1020	210,881	22	7,314
500 " " 1,000 . . . . .	287	224,523	51	42,627
1,000 " " 2,000 . . . . .	247	368,193	62	92,027
2,000 " " 4,000 . . . . .	211	607,162	61	179,174
4,000 " " 6,000 . . . . .	160	804,079	60	308,336
6,000 " " 8,000 . . . . .	124	862,389	53	367,447
8,000 " " 10,000 . . . . .	53	466,585	25	219,769
10,000 " " 15,000 . . . . .	18	226,366	3	32,955
15,000 " " 20,000 . . . . .	6	104,972	2	32,256
20,000 and above . . . . .	9	267,770	1	21,010
Age in years—				
Under 5 . . . . .	220	669,350	17	65,729
5 and under 10 years . . . . .	340	969,760	70	339,226
10 " " 15 " . . . . .	526	1,222,807	73	305,930
15 " " 20 " . . . . .	251	298,216	29	145,131
20 " " 25 " . . . . .	247	309,153	44	162,715
Over 25 years . . . . .	551	673,634	110	284,381
Total . . . . .	2,135	4,142,920	343	1,303,112

and a somewhat similar analysis of German ships is given in Table XIV. Both Tables suggest that neither age nor size is necessarily a criterion of a ship's usefulness.

It has been clearly manifest during the past year that, whatever

the conflicting views as to what ships are useful and what are not, this incubus of surplus tonnage must be removed. The American ships, for example, to which reference has just been made have been a menace to the freight market ever since their creation, and, except for a year or two in the early part of their career, have in very many cases contributed nothing to their upkeep, and have been a perpetual source of loss to their owners and a bogey to the international freight market.

Two main proposals have been put forward for dealing with the situation. One is the laying up, by agreement for a certain period, of sufficient ships to strengthen the freight market so as to bring up rates to a modestly remunerative level. The definite withholding of tonnage under these conditions, and control in the release of shipping for legitimate market requirements and expansion, would have a stabilising action on rates which, if it were possible to introduce such a scheme, would undoubtedly make for healthier shipping conditions and, on the whole, be better for traders by avoiding those violent fluctuations of freight rates which, in the long run, are prejudicial to the interests of merchants themselves. Experience of the stabilisation of liner rates has shown that shippers are as reluctant to face up to the disturbances of a freight war as the shipowners themselves.

Opportunities which presented themselves for the regulation of tramp tonnage, which is the key to the freight market, failed to produce a scheme acceptable to those to whom it was addressed. The laying-up proposals of the Chamber of Shipping last autumn were decisively rejected by tramp shipowners, and while, perhaps, they were justified in doing so on the merits of the scheme as laid before them, it is nevertheless regrettable that no alternative proposal was evolved by which a start might have been made in the direction of the regularisation of tonnage supplies. Admittedly the difficulties are enormous, the necessity for international co-operation vital, and distrust of compatriots and of other nationals understandable. The opportunity was, however, a golden one, and it was lost.

As the year drew on it became obvious that international co-operation was unlikely to be fruitful and the negotiations certain to be tedious. Owners are hardly to be influenced by co-operative schemes on an ascending freight market, and anything in the nature of protraction would bring its own disaster. Moreover, the urgency of the problem suggested another and more immediate source of alleviation—the scrapping of ships. Plans were formulated in Germany for breaking up, with Government assistance, about 400,000 tons, equal to a net reduction of the German mercantile marine by about 10 per cent. Italy proposes to scrap 200,000 tons of her older cargo ships by the spring of this year. Japan is to break up, during the next three years, 650,000 tons of ships more than twenty-five years old. The American sacrifice has already been discussed. These proposals involve the removal in time of 2,000,000 tons, but this contribution can hardly be said to do more than scratch the surface of the problem of this incubus of 13½ million



tons. Indeed, the Japanese instance serves to accentuate one point which shipowners have been urging, namely, that it is useless to scrap tonnage if other ships are built in their stead. The Japanese proposal, for example, provides for 50 per cent. of the scrapped tonnage to be replaced by modern ships, for which a subsidy of 20 yen per ton will be paid. A similar objection has been raised to the compulsory laying-up proposals, and the whole subject, therefore, instead of resolving itself into a simple process of getting rid of old surplus ships, will be seen to bristle with difficulties.

Although there has been a considerable amount of scrapping voluntarily carried out by shipowners—if, indeed, the word “voluntarily” can be applied to economic duress—and this scrapping, accompanied by a marked reduction of shipbuilding activity, has been responsible for the net reduction of the mercantile marine of the world as shown in the beginning of this article, it has not yet proceeded far enough, notwithstanding a more rapid shrinkage than is indicated in Table XV, which gives the last available com-

TABLE XV.—STEAMERS AND MOTORSHIPS BROKEN UP.

	No.	Tons.
1921 . . . . .	34	77,545
1922 . . . . .	160	315,110
1923 . . . . .	385	962,506
1924 . . . . .	485	1,174,258
1925 . . . . .	273	653,046
1926 . . . . .	358	798,633
1927 . . . . .	189	402,698
1928 . . . . .	296	735,547
1929 . . . . .	352	943,609
1930 . . . . .	311	848,538
1931 . . . . .	324	1,018,174

plete figures. The rate of annual wastage is very variable. In some notes on the subject Lloyd's Register states that during the period 1905–1914 the minimum was 87,737 tons and the maximum 251,900 tons. Practically no tonnage was broken up between 1915 and 1920. During 1921 the amount was 77,500 tons, and then the first post-War shipping slump made itself felt and conditions arose which in many respects were similar to those ruling to-day. The tonnage broken up increased. During 1922 it rose to 315,000 tons, to 963,000 tons in the following year, and then to 1,174,000 tons during 1924. That was a record never again approached until 1931, when 1,018,000 tons were broken up. When complete figures for 1932 are available there is little doubt that they will eclipse the 1924 total.

On the other hand, the natural reduction of existing tonnage by marine casualty is less than it was (Table XVI). The commonly accepted view is that improved navigational aids are largely responsible. There is also no doubt that the large amount of shipping withdrawn from active service has contributed to the change. The average yearly percentage of steam tonnage lost during the

years 1927-1931 amounted to only 0.68 per cent., whereas during the years 1909-1931 the average was nearly 1.17 per cent. The aggregate steam and motor tonnage broken up during the nine years 1923-1931 was 7,537,000 tons, representing a yearly average of 1.3 per cent. of the tonnage owned. Adding losses by marine risk, the average wastage of sea-going merchant vessels does not reach

TABLE XVI.—TONNAGE LOST AND BROKEN UP.

Year.	Steamers and Motorships.		Sailing Ships.	
	No.	Tons (gross).	No.	Tons (net).
1916 . . . . .	1,288	2,724,041	511	284,224
1917 . . . . .	2,605	6,607,261	748	520,206
1918 . . . . .	1,294	3,332,791	325	159,919
1919 . . . . .	425	524,172	241	112,658
1920 . . . . .	370	518,595	215	138,959
1921 . . . . .	344	536,537	215	137,720
1922 . . . . .	511	743,866	205	143,946
1923 . . . . .	709	1,456,870	259	259,909
1924 . . . . .	777	1,614,662	239	243,017
1925 . . . . .	553	980,794	186	161,241
1926 . . . . .	656	1,226,873	182	117,070
1927 . . . . .	469	852,398	154	139,671
1928 . . . . .	584	1,220,176	121	94,471
1929 . . . . .	672	1,458,665	120	84,937
1930 . . . . .	561	1,232,521	107	80,763
1931 . . . . .	558	1,335,708	64	33,112

WAR LOSSES INCLUDED IN THE ABOVE TABLE.

Year.	Steamers and Motorships.		Sailing Ships.	
	No.	Tons (gross).	No.	Tons (net).
1916 . . . . .	942	2,189,079	245	139,609
1917 . . . . .	2,211	5,957,913	523	392,449
1918 . . . . .	911	2,674,428	141	69,744

2 per cent. of the tonnage owned. The total figures for tonnage broken up during the nine years include 1,925,000 tons registered in Great Britain and Ireland, 2,522,000 tons in the United States, 839,000 tons in Italy, and 719,000 tons in France. It will be seen, therefore; that, even at this abnormally increased rate of scrapping, no very marked shrinkage of the mercantile marine can be expected. The problem of this apparent surplus of 13½ million tons will not be solved by the ordinary processes which have been going on for years, even with the further stimulation of the breaking-up schemes which have already been announced.

JOHN P. TAYLOR.

## CHAPTER VIII.

### BRITISH SHIPPING POLICY RECONSIDERED.

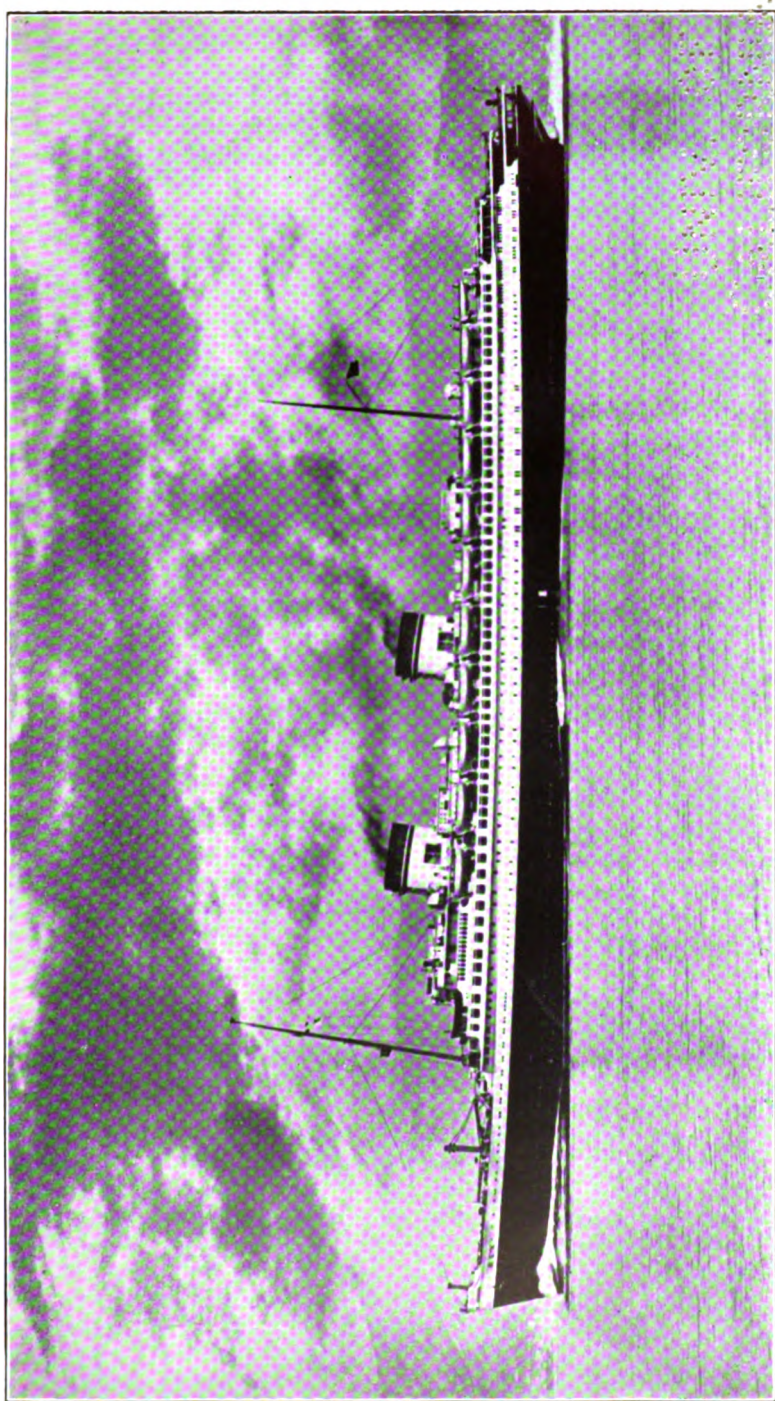
VERY many years have passed since British shipping policy has been considered collectively in so exhaustive a manner as was the case last year. In 1917 a committee was appointed by the Chamber of Shipping to advise generally on policy, and in January, 1932, Mr. F. C. Allen, the President, proposed the appointment of a committee so constituted as to give an opportunity for the expression of all lines of thought and with the object of arriving at an agreed policy.

The wording of the resolution from which the committee sprang indicated that there had not been complete agreement throughout the shipping industry as to the remedy for a disturbing state of affairs. Indeed, as the report subsequently issued by the Chamber showed, suggestions both from within and without the shipping industry continued to be made in favour of applying a policy of protection to shipping. The forms which this suggested protection took included the reservation of the United Kingdom coasting trade, the reservation of inter-Imperial trade, and the imposition of discriminatory duties on foreign ships and of discriminatory Customs duties on cargoes in foreign ships.

Although these proposals had been advanced with force in certain quarters, there is no reason to think that there was any real difference of view among owners as to the causes of the troubles. The British shipping industry has long stood for equal opportunities for all. Even in the coasting trade it has been prepared for the competition of foreign owners—if they desired to compete. The working costs of British shipping have not been by any means the lowest in the world ; indeed, those of some mercantile marines have been far lower, and foreign shipowners have not been subject to the same exacting requirements as the British Board of Trade imposes on British shipping. About competition of this kind British shipowners have not complained. They have relied on giving efficient service at reasonable charges.

### GROWTH OF FOREIGN SUBSIDIES.

Gradually, however, the conditions in other mercantile marines have been changing. Subsidies in one form or another have greatly increased. Yet so averse was the British shipping industry, as represented by the official associations, from causing any unnecessary trouble that it drew a distinction between discrimination between flags, to which it took the strongest possible objection, and the



ITALIA LINE'S REX.  
(Builders, Soc. Anon. Ansaldo, Sestri Ponente.

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payment of subsidies. Much as it disliked the payment of these grants-in-aid, it was long disposed to reason that they were a matter of internal politics with which other nations could not interfere.

The United States has been very prominent in the subsidising of services between that country and other parts of the world. The forms which the assistance principally takes are payments for mail contracts far in excess of the commercial value of the services rendered, which is what foreign lines carrying American mails would receive. This state of affairs is not disputed. Enormous sums are paid out every year to American shipping lines. In addition, American companies during the last few years have been able to buy Government-owned ships at extremely favourable prices. France, Italy, Japan are among the nations which have given extensive financial support to their shipping services.

The evil done to international commerce by these payments is extremely far-reaching. There is no escape from the fact that international commerce involves an exchange of goods and services. Great Britain certainly cannot import the foodstuffs and other commodities which are necessary for her existence unless she exports goods and services. Shipping has been one of the chief among the latter. When, therefore, a nation is prevented from paying by services for goods imported, as she has been accustomed to do, a trade barrier is at once erected. It may be submitted that the policy of the United States—and her case is taken as an outstanding one—in establishing at heavy cost numerous shipping services is entirely inimical to the interests of her exporters. Shippers of American goods have been told that it was for their benefit that direct shipping services to all parts of the world were established and State-supported. Actually large quantities of the goods were previously being carried very cheaply indeed by vessels flying foreign flags, and the freights paid for the transport of the goods gave the foreign countries purchasing power. When the services are conducted by the United States on a subsidised basis, the purchasing power arising from any profit earned by the foreign carriers is curtailed.

The evil does not end there. The freight markets have been flooded by State-owned tonnage, and the larger the supply of this shipping the worse the condition of the industry. Rates of freight have been cut—sometimes by the managers of Government-owned vessels and sometimes by private owners who, naturally enough, had to do all they could to conserve their trade connections. Besides the reduction of rates the available trade—and for years it has been a diminishing quantity—has to be spread over a larger volume of tonnage, and the inadequacy of the rates is accentuated when they apply to only part cargoes. The State-owned services in such circumstances become more and more costly, and by their withdrawal of purchasing power from other nations they have become an influence contributing to bring about the crisis in international commerce. Their cessation seems to be one of the measures required to free commerce from the chains which are shackling it and preventing the free exchange of goods and services.

State subsidies are used to support liner services the maintenance

of which otherwise would be impracticable. New considerations of national pride have been introduced to shipping, for services are no longer judged by their ability to pay their way; their continuance depends on the willingness of the taxpayers of different countries to meet the costs, and the support of such bolstered-up services is not submitted as a clear-cut issue to the electorate. Subsidies are also given to cargo vessels, an outstanding exponent of this plan being Italy. Large sums have been allocated for the assistance of Italian cargo vessels, and the effect of these must be harmful to the shipping industries of the world. In competing for freights Italian owners begin with a definite advantage in their favour, due to their receipt of payments from the State. Other owners who are not assisted in this way find themselves at a disadvantage, and discover that uneconomic rates are accepted. Sometimes they are faced with the choice of accepting similar rates and themselves bearing the loss, or of declining business. Another form of non-economic competition is the direction, by order of Governments, of certain proportions of trade into national vessels. Such direction has taken place in the case of British exports of coal to Italy.

It is because they were confronted with a set of circumstances, including those mentioned, which have prevented them from competing either in liner services or in ordinary cargo trades on terms of equality that some British owners months ago became extremely restless and began to maintain that British shipping could no longer afford to refuse any kind of State assistance while a host of measures of one type or another were designed to promote the welfare of certain foreign mercantile marines. The result of this agitation was the appointment of the Committee on Policy by the Chamber of Shipping which was mentioned at the outset of this article, and in the report of that committee, published in July, it is easy to see how British owners have been influenced by the measures adopted abroad, while maintaining their ideals of equality for all. Such effects have also been noticeable in the subsequent public utterances of authoritative spokesmen for the shipping industry.

#### THE TARIFF QUESTION.

There is some similarity between this change of attitude on the part of shipowners towards the principles which, in the present circumstances, should govern their policy and that which has been noticeable on the question of tariffs. The natural trade policy of shipowners is free trade. They would best be able to carry on their industry by the free exchange of commodities and goods, carrying from one part of the world commodities which could best be produced there, or goods which could best be manufactured there, to other parts of the world and *vice versa*. But British owners, who had no doubt of the soundness of such an exchange of commodities and goods, learned by experience that other nations would not work on these lines and were shutting their doors to imports or imposing high duties against their entry. Some therefore reached the conclusion that this country must fight with the weapons which other nations

had chosen. They recognised that tariffs might be a means of bargaining, and they realised also that over and above the interests of shipping—their own industry—there were the over-riding interests of the nation as a whole, and that even if a fair measure of activity could be secured for the sea transport industry this would avail it little if all the other industries of the country were reduced to bankruptcy. The policy of tariffs was chosen by other countries, and many business men whose instincts leaned towards free trade held that in the circumstances which had been created a trial, at any rate, of other methods was forced on Great Britain. Thus the insistence by other countries on giving support to their shipping industries has forced British owners to the conclusion that something of the sort, or some form of protection, may be needed in order to prevent the complete decline of British shipping.

#### THE PARAMOUNT NEED OF SHIPPING.

The report of the Policy Committee began by asserting that the paramount need of the shipping industry is the restoration and development of a prosperous world trade. That declaration cannot be contradicted, although it may be qualified by the statement that a prosperous world trade cannot be secured until evils like the State support of shipping have been removed. The assertion followed that the Empire should lead in organising a co-operative movement for the removal, or reduction, of trade barriers and the restoration of the exchange of commodities. The issue of the report preceded the Imperial Conference at Ottawa.

The Committee then asserted the importance of free access to an open freight market, i.e. freedom to traders to use the most effective and efficient carrying power available, as being essential to the prosperity of international commerce. This declaration was in accordance with the policy long pursued by the British shipping industry.

Dealing with trade between the British nations, the Committee urged that the British shipping industry, in the interests of this country and of the Empire, should adhere to the policy of freedom of the seas, on a footing of equality for all ships, under all flags in all ports, in all international and in all inter-Empire trades, and that in so doing it would best serve the interests not only of British trade and shipping but of the trade and shipping of the world. This statement answered those who have urged that there should be reservation of trade between the British nations to British ships, or that British ships should be given some form of advantage. Actually, by far the greater part of the trade between the British nations is already carried on by British vessels. This is particularly true of the liner services, and is explained, mainly, by the fine provision which has been made by the British companies for regular and frequent sailings.



## COMPARISONS WITH DUMPED GOODS.

Next, the Committee declared that "the appalling conditions to which the shipping industry has been reduced are mainly attributable to the direct and indirect action of Governments in bringing ships into existence for political, not commercial, reasons, and in persisting in the running of such ships at heavy loss, at the cost of the taxpayers, while such Governments have, at the same time, been imposing ever-increasing limitations and restrictions on the volume of the cargoes passing through their ports. State-aided ships, like dumped goods, have no place in trade—they are a standing menace to the freight market and hamper the operation of all ships operating on an economic basis."

This comparison of State-aided ships with dumped goods is particularly noteworthy because something was heard at Ottawa of dumped shipping services. Just as dumped goods are those which are exported at below cost because they are part of an enormous output and it suits manufacturers to try to develop an oversea market, so dumped shipping services are those which are maintained at below cost price with the assistance of Governments for ulterior motives.

## DISCUSSIONS AT OTTAWA.

A resolution of the Imperial Economic Conference in 1923 was then recalled. A decade ago discrimination by foreign countries, whether open or disguised, was being practised, and the representatives of the Governments of the Empire laid it down that their established practice was to make no discrimination between the flags of shipping using their ports, and that they had no intention of departing from this practice as regards countries which treated ocean-going shipping under the British flag on a footing of equality with their own national shipping. They then asserted that "in the event of danger arising in future to the overseas shipping of the Empire through an attempt by a foreign country to discriminate against the British flag the Governments of the Empire would consult together as to the best means of meeting the situation."

One question of much interest is known to have been considered at Ottawa at the instigation, particularly, of the Australian and New Zealand authorities. The peculiar position has existed that an American line has maintained services between San Francisco and Australia and New Zealand, with calls at the Pacific Islands. The trade between the United States and these islands is treated as American coastwise traffic, and so British vessels are debarred from participating in it. On the other hand, the American vessels are permitted to carry passengers and goods between Australia and New Zealand—two British countries. The arrangement is obviously one-sided, and the competition which the British ships have to face is accentuated not only by the heavy mail payments which the American ships receive, but also by their ability to carry cargo on one part of the voyage which helps to meet their expenses and is

denied to British vessels. These anomalies indicate the need for bringing shipping practice into line.

In the autumn the views held by, at any rate, the majority of the shipping industry were clearly expressed by Lord Essendon, the chairman of Messrs. Furness, Withy and Co. The only true basis of international shipping was, he said, that the vessel that could carry the goods most efficiently and without any artificial restraints or incentives should do the trade. Any other policy adopted by any country simply meant unnecessary taxation of its citizens and higher costs for the commodities it imported and exported. Great Britain had left the coasting and Empire trade open to foreign ships; it had suffered the competition of ships that were operated on a lower scale than British vessels; and it had refrained from subsidising its shipping, preferring to leave the industry to build on its own solid foundations. As the country had found it necessary to alter its general financial policy, so might the shipping industry be compelled to alter its independent policy and to smother the spirit of adventurous and courageous enterprise which had so well served it and the whole field of international trade in the past. Later, presiding at the meeting of Manchester Liners, Limited, Lord Essendon said that there was no longer any such thing as the freedom of the seas in the sense of shipowners being free to conduct their business on accepted commercial lines, as at every turn there was either some trade restriction or some State-aided competition which was gradually taking the shipping industry out of the realm of ordinary competitive commerce.

#### COASTWISE SERVICES.

Special consideration was given by the Policy Committee of the Chamber of Shipping to the coastwise trade. The majority stated that they were not in favour of the reservation of the United Kingdom coasting trade to British ships, in the interests either of the industry as a whole or of the coasting trade itself. All that they had written about the need for securing and enforcing absolute equality of treatment for ships under all flags applied, they held, with special force to the United Kingdom coasting trade. Certain members of the coastwise industry dissociated themselves from that portion of the report which implied that the coasting trade should not be reserved to vessels carrying the British flag. It was claimed that numerous instances were available of British tonnage being laid up, with consequent unemployment of the crews, while similar-sized foreign tonnage was carrying cargoes between British ports which the national tonnage formerly conveyed. Mr. E. H. Watts, who is the managing director of a company owning a large fleet of cargo ships, also thought the point should be emphasised that countries which endeavour to obtain unfair advantages for their own flags over the British, whether by direct discrimination, by subsidies, by reservation of trades, by not conforming to Conventions (an important matter in view of the time expended on agreeing on international conventions and the dilatory habits of foreign countries in giving

practical effect to them), or by any other means promoting unfair competition to the detriment of British shipping, were violating the principle of the freedom of the seas. Therefore, he held, it should be plainly stated that, as a last resort, a policy of retaliation and self-protection might have to be aimed at those countries which would not discard all forms of discrimination and strictly adhere to the principle of the freedom of the seas. He considered that the time for this action had arrived.

Another leading manager of British cargo shipping, Mr. Philip Haldin, expressed the view that measures would have to be taken to counter the foreign subsidising of shipping. In a letter published in *The Times* of October 19 he suggested that countries which subsidised their mercantile marines at the expense of Great Britain should be warned that if these subsidies were not withdrawn within a reasonable time the foreign vessels would be charged double dues when loading or discharging cargoes in any part of the world where the British flag was flown. He proposed that the amount raised by these extra dues should be paid into a fund to be used for compensating British shipowners for laying up their vessels.

#### A LATER REPORT.

In another report of the Policy Committee, which was unanimously adopted at a meeting of the Chamber of Shipping on December 1, it was again emphasised that free access to an open freight market is essential to the prosperity of international commerce, and that there can be no such market in any country which is discriminating in favour of ships under its own flag, whether such discrimination takes the form of building or operating subsidies, the granting of preferences to cargoes carried in such ships, or the imposition of restrictions on ships under other flags or on their cargoes.

The report went on to say that subsidies to British shipping could prove no permanent basis for the maintenance of our position as the greatest carriers of world trade, but that if the British Mercantile Marine is to continue as it now exists it will be necessary for the United Kingdom to meet foreign State-aided competition, if it be persisted in, by the grant of subsidies to British shipping pending the restoration of world trade. In an Annex, which was being placed before the Government as a confidential paper, a summary was given of the methods of reservation, restriction and discrimination, as regards shipping, that are or could be made available to this country if it be forced to abandon its traditional policy of freedom of the seas and of access to all ports on terms of equality in all international trades, and to take retaliatory steps in defence of its own shipping. The aim of this summary, it was stated, was to provide a basis for the arguments that could be brought before the World Economic Conference in support of the demand for the sweeping away of all forms of flag discrimination.

CUTHBERT MAUGHAN. "

## CHAPTER IX.

### THE SAFETY AND LOAD LINE CONVENTIONS.

THE two Conventions on Safety of Life at Sea and Load Line, which were ratified by the majority of the contracting Governments on October 1 last and came into operation, as far as their ships are concerned, on January 1, 1933, constitute between them a comprehensive international code, or rather the first edition of a comprehensive international code, covering, sometimes in detail and sometimes by a mere statement of principle, practically the whole of the area covered by the existing statutory safety regulations. The only point of any importance not dealt with in any way is the special rules governing the carriage of grain, an omission which can easily be rectified later on if this should prove to be desirable.

The new code is a most interesting experiment, not only to shipping men but to all those who care to study the possibilities of co-ordinated international action in a definitely prescribed subject matter over the whole surface of the globe. Its outstanding features are, first, that in the most international of all trades, shipping, international standards are being set up by which all agree to be bound, so that competition will in future take place on a fairer basis ; second, the code is based on a very careful review of the existing national rules and practice, which has throughout aimed at making the new international standard as high and as comprehensive as circumstances would permit, as is shown by the fact that in the matter of wireless and in the protection of the deck openings of the ordinary cargo ship the Conventions mark a distinct advance on anything that preceded them ; and third, the new code recognises, not so much by any one explicit statement as by references scattered throughout its pages, that the right method of dealing with the common antagonist, the sea, is by means of common action and co-operation.

The Conventions mark a definite turning point in the history of shipping, but they are the outcome of many years of preparation, for the inconvenience caused by ships being subject to different sets of national regulations in different ports in the course of their voyages, and the desirability of common action in a common subject matter, were as obvious to our predecessors as they are to ourselves. But things had to proceed step by step. A few of these steps may be mentioned. In 1862 foreign tonnage measurement certificates, if given on the same principles as the British, were officially recognised in British ports, and in the same decade the

first steps were taken towards formulating what are now known as the international regulations for preventing collisions at sea, the rule of the road at sea. Fourteen years later, in 1876, power was given to recognise foreign certificates of survey of passenger ships where the Board of Trade were satisfied that the foreign survey was substantially equivalent to the British. The same principle was followed in 1890 when a prescribed load line was first made compulsory; where the Board of Trade were satisfied that foreign regulations with respect to overloading and improper loading were equally effective with the British, the foreign ship was free from liability to detention or penalty when in ports of the United Kingdom.

This principle, that foreign regulations should be recognised when they were equally effective with the British, was repeated and emphasised in 1906 when all the British safety regulations were applied to foreign ships while in United Kingdom ports. It was at that time suggested to foreign authorities that it would be much more satisfactory to them that their ships should comply with rules of their own, which could be regarded as being equally effective with the British, than that the British rules should be imposed upon them in British ports, and this suggestion, which came at a time when foreign authorities were of their own accord studying safety regulations, was adopted in several cases. In this way there came to be a gradual approximation on the part of maritime nations towards a common standard in the matter of safety regulations, and the sinking of the Titanic in 1912 caused an attempt to be made to secure international agreement on the subjects most prominently raised by that accident, viz. boats, bulkheads, wireless, and navigation near ice. An international Conference was held in London towards the end of 1913, which resulted in a Convention, dated January, 1914, containing safety regulations for passenger ships, and new provisions about wireless; it was understood by all concerned at the time that this Convention would be followed by one on load line which would secure the safety of the ordinary cargo ships. The War prevented for a time any progress from being made either with the Safety Convention or with load line, and after it was over some time had to elapse before a considered programme, which would be likely to lead to international agreement, could be prepared for submission to the maritime powers. Eventually Conferences in London, in 1929 on safety of life at sea, and in 1930 on load line, produced the two Conventions which have now come into operation.

The Convention on load line, and the previous history of the load line question, have been so exhaustively dealt with in previous issues of this "Annual" by Sir Charles Sanders that it is only necessary to touch on some of the general features of that Convention. The other Convention, however, is not so well known. It is printed as a Schedule to the Merchant Shipping (Safety and Load Line Conventions) Act, 1932, in which both Conventions were approved by Parliament, and of its 83 pages no fewer than 58 are devoted to the four subjects which attracted most attention at

the time of the Titanic, viz. bulkheads, boats, wireless, and ice. The provisions as to bulkheads and boats are of a very detailed character, and between them take up more than half the Convention. This seems a disproportionate amount of space to give to two things which, important as they are, do not come into operation until after an accident has occurred ; but legislation which has to be based on the current needs of the day is often a disproportionate mixture of principles and details, and these two particular subjects had been so intensively studied in several countries that it was possible to get agreement on subordinate principles and matters of detail. It was felt that, provided it is flexible enough and does not go into too much detail, the more body an international standard has the more useful it will be in practice in securing real international uniformity. Flexibility is secured by allowing any new appliance or thing to be accepted if it is equally effective with any particular appliance or thing specified in the Convention, and by providing that the Convention can be modified by an exchange of letters between the Governments.

There are therefore good reasons for giving so much space to bulkheads and boats, and in fact the chapters on these two subjects extend far beyond mere subdivision and boatage arrangements. The chapter on subdivision, for instance, contains the very comprehensive general requirement that every passenger ship before being put on service, and once at least in every year afterwards, must be thoroughly surveyed to see that in every respect—hull, boilers, machinery and equipment—it is fit for the service intended. All new passenger ships must be inclined for stability. The detailed rules as to the bulkheads themselves are followed by requirements as to fire-resisting bulkheads, side openings in the ship, pumping arrangements, and auxiliary steering apparatus. The chapter on boats includes, in addition to detailed rules about lifeboats and other kinds of life-saving appliances, provisions as to the means of access to the different compartments and decks, and as to the lighting of the boat decks and of the water alongside ; it contains a number of rules as to fire detection and extinction—a most important subject in these days of oil, but not directly connected with boats—and also deals in general terms with the general question of the carriage of dangerous goods in ships.

The above shows how the Convention has grown, and how, as the work of framing it proceeded, it was found necessary to include in it new provisions taken either from the existing regulations of one or more of the maritime countries or from recent study and experience. It has extended much beyond the limits originally contemplated, and is now rather like a patchwork quilt, thick in some places and very thin in others, covering a very wide surface.

To enable the general reader, not possessed of special knowledge, to obtain a bird's-eye view of the more important features of the Convention, it will probably be better not to follow too closely the order in which the various items appear in the printed text, but to group them together in blocks where they appear to have an inner connection, and the first block to be considered is that containing

the provisions for preventing accidents happening, and for securing that ships shall be fit to withstand the perils of the sea.

#### METEOROLOGICAL SERVICES.

At the head of this block come the intelligence services which the Governments agree to establish, on the principle that navigation is affected by the forces of Nature and that knowledge of the way these forces operate is of service to the seaman. The Governments agree to encourage the collection of meteorological data by ships, and to arrange for their examination, dissemination, and exchange; they will co-operate in issuing weather warnings to ships, and will arrange for these messages to have a definite priority. Every weather message intended for ships shall be issued by the national service in the best position to serve the zones and areas to be covered, in accordance with arrangements made beforehand; and generally every endeavour shall be made to obtain a uniform procedure in international meteorological services (Article 35). Every ship which meets with dangerous ice, a dangerous derelict, a dangerous tropical storm, or any other direct danger to navigation is bound to communicate the information to ships in the vicinity and to the nearest coast station (Article 34).

The points to be noticed here are the definite enunciation of the principle of co-operation, and the requirement that ships *shall* do something, not for their own sake but for that of others and to promote the general safety. It is obvious, of course, that the greater the general safety the greater is the safety of each individual, for if I am compelled to send you a warning to-day, or listen for your distress call, you may be doing the same thing for me to-morrow; but the embodiment of this principle in compulsory legislation is a recent thing and is worth noticing.

Connected with the weather services is the recommendation, made at the instance of the Government of India, that emergency cyclone warnings should, at the discretion of the coast station sending them out, be preceded by the alarm signal so that it may attract the attention of ships fitted with the auto-alarm apparatus, which is set in motion by the alarm signal. This involves a modification of the international rules as to radio, but it is one which clearly should be made in the interest of safety (Recommendation 7).

The last provision applies only in cyclone areas, and the next one, as to an international service dealing with ice and derelicts, applies only in the North Atlantic. The service was established after the Conference of 1913-14, and it is carried out by the United States Government on behalf of the Governments specially interested in the North Atlantic traffic, who contribute to the cost of the service in specified proportions. These proportions were revised by the last Conference to correspond with present-day conditions, the scope of the service was re-defined, and the United States authorities, who have performed this international service to the complete satisfaction of all concerned, were invited to carry it on. The duty of the service is to guard the southern limits of the ice and warn

passing vessels, to observe and study ice conditions in general, and to destroy or remove derelicts (Articles 36 and 37).

Another subject peculiar to the North Atlantic is that of the routes or tracks to be followed by east- and west-bound vessels at different seasons. The selection of the routes is left, as hitherto, to the companies, but they are bound to give proper notice of them, to observe them, and so to arrange them that they do not cross the fishing banks off Newfoundland (Article 39).

Of world-wide application are the regulations for preventing collisions at sea, which apply to the ships of all nations on the high seas everywhere. As many countries are concerned which were not represented at the recent Conference, the Conference, after a very thorough discussion, agreed that certain alterations ought to be made, but left it to the British authorities to obtain the assent of the other countries concerned. This process is, it is understood, now practically completed, so the issue of the revised regulations should not be long delayed. The main principles of the rules are not touched, but a number of alterations in detail are made to bring the rules as to lights and fog signals up to date (Article 40).

Connected with the collision regulations is the question what rules ought seaplanes to follow when on the water. Strictly speaking, they are "steamships" within the meaning of the present rules and bound to manœuvre as such, but this is physically impossible. At the same time there are certain things which they can, and should, do to prevent collision with other craft, and the British Government are asked to take steps to formulate these requirements and obtain international agreement (Recommendation 14).

#### HELM ORDERS.

It was stated above that the main principles of the collision regulations have not been altered, and the steering and sailing rules, as they are called, remain as they were before, but the Convention makes a great change in the manner in which helm or steering orders, that is, orders to the steersman, are to be given in future on British ships. The Convention requires all such orders to be given in the direct sense; that is to say, when the ship is going ahead, an order containing the words "starboard" or "right" may be used only when it is intended that the ship shall move to the right. The traditional British system dates from the time when ships were fitted with a visible tiller, and under it an order containing the word "starboard" means that the ship's head is to go not to starboard but to port. For some time past foreign countries have been gradually replacing the indirect method by the direct, and it was urged strongly by representatives of foreign Governments, both at the 1913-14 Conference and at the 1929 Conference, that there ought to be international uniformity in this matter, and that this uniformity should be based on the direct method. It was known that a large number of British sailors would be reluctant to change the traditional method to which they had become accustomed, and there was a fear that the alteration might in a moment of emergency



cause the wheel to be put the wrong way ; but the evidence from foreign countries was that the change had in fact been effected without difficulty or danger, and it was also clear that agreement on this point would be useful in obtaining agreement on other points of even greater importance. The matter has been so thoroughly discussed in nautical circles that men's minds are prepared for the change, and there is no doubt that British ships can effect a change which has been successfully carried out by foreign ships. The Convention does not prescribe what words shall be used in giving orders to the steersman, but only that they must be in the direct sense (Article 41).

The above paragraphs relate to common services and regulations for preventing accidents when ships are at sea ; and we come now to a group of subjects concerned with the fitting out of the ship before she goes to sea. The most important of these is the periodical survey which every ship, passenger or cargo, is compelled to undergo in order to secure that she is in all respects fitted for her work.

#### SURVEYS.

In the case of a passenger ship, there must be a comprehensive survey before the ship is put in service, and afterwards a survey at least once in every 12 months, to secure that in every respect—hull, boilers, machinery, and equipment—the ship is fit for the service intended. This survey guarantees that the ship shall be constructed, fitted, and arranged so as to comply fully with the requirements of the Convention (Regulation XXII).

In the case of a cargo ship, the procedure is somewhat different, but the result is very much the same, inasmuch as there are periodical surveys to secure that the ships shall be fit for their work. Every cargo ship must be marked with a load line indicating the point to which she may be submerged, that is, the amount of cargo she may carry across the sea, and this load line cannot be assigned until it has been ascertained in accordance with definite rules that the ship is in every respect fit to carry that amount of cargo. A load line certificate is in other words a certificate as to the seaworthiness of the cargo ship. No cargo ship may go to sea without a load line certificate, and she must be re-surveyed once at least in every five years thereafter (Load Line, Articles 5 and 14). In addition, so much importance is attached to protecting the more vulnerable parts of the cargo ship, that is the openings in the deck and in the sides, that very special attention is devoted to these points, and they have to be surveyed annually (Load Line, Article 5 and Recommendation 3).

A notable feature in connection with these surveys is that while in some cases, such as British passenger ships, the survey is carried out by Government surveyors, in other cases they are carried out by surveyors of the classification societies acting under the authority of their respective Governments. The great majority of British cargo ships are surveyed for load line, and have their load lines

assigned to them, by classification societies acting under the authority of the Board of Trade, and probably much the greater part of the work of surveying ships throughout the world, to see that they comply with the standards laid down by the Conventions, will in fact be done by the officers of the classification societies under the authority of the Governments. These societies were formed by the commercial interests primarily concerned in the running of ships, viz. shipowners, merchants, and underwriters, for the purpose of surveying ships and seeing that they are fit for the work they have to do. They are concerned primarily with the safety of property, and as their work has proceeded the principle has come to be more and more firmly established that in the long run the safe ship is the profitable ship. The safety of the ship herself secures the safety of those on board her, and thus the action of Governments, which regulate shipping in order to promote safety of life, was directed to very much the same main objects as those aimed at by classification societies. Historically both Governments and commercial interests, as represented by the classification societies, have been working for years to secure increased safety at sea, and the present Conventions recognise that both elements, the commercial and the Governmental, should continue to work together for this common object.

The survey of a ship necessarily covers all the points relating to material which are dealt with either in the Conventions or in the national regulations. The Conventions say very little about personnel; apart from the fact that a minimum number of trained lifeboat men must be carried to work the boats, the Safety Convention deals with manning only by a clause of four lines to the effect that the Governments undertake, each for its national ships, to maintain, or if necessary to adopt, measures for the purpose of ensuring that from the point of view of safety of life at sea all ships shall be sufficiently and efficiently manned. Effective manning is essential to the safety of ships at sea, and a scale prescribing the minimum number of deck hands to be carried has for many years been in force in the British Mercantile Marine so far as cargo ships are concerned. There is no manning scale for passenger ships, and there is no reason to think that a prescribed scale is necessary. It would, moreover, be extremely difficult to construct a manning scale which would fit the circumstances of the different classes of passenger vessels.

Another subject that can be grouped with the survey requirements is that of fire protection, which is dealt with in Regulation XLIII of the Safety Convention. The Regulation deals with fire detection as well as extinction and requires an efficient patrol system to be maintained in passenger ships as well as an automatic fire alarm system. The pumping arrangements must be such that two powerful jets of water shall be available simultaneously in any part of the ship occupied by passengers, cargo, or crew, and in addition, smothering gas has to be available for each cargo hold. Portable fluid extinguishers and smoke helmets are also to be provided.

An interesting part of these regulations is the provision made for dealing with fires in ships using oil fuel, where the consequences of a fire that got well hold of the boiler-room can readily be imagined. The object here must be to blanket the oil fire as early as possible, and the Convention, following in this respect the British regulations, which were drawn up in concert with the liner companies, provides for an apparatus capable of covering the floor of each boiler-room or machinery space with 6 in. of froth ; the apparatus must be such that it can be put in operation from outside the boiler-room, for the reason that a sudden blaze might drive the firemen out of the stokehold. A froth apparatus is also required in the case of motor ships (Regulation XLIII).

Closely akin to the subject of fire prevention is that of the carriage of dangerous goods. Detailed regulations have been worked out by the Board of Trade over a long series of years, based on the experience that had been accumulated and the advice that has been received from the Explosives Department of the Home Office and other authorities. These instructions contain notes on a long list of substances, and indicate what precautions are to be taken in the matter of packing, stowage, etc. They have been of great assistance to shipping, and have been accepted by the Suez Canal Company, but up to the time of the Conference nothing had been done in the direction of getting international agreement. The subject is a technical one on which it is very desirable that there should be international agreement, in order that the same standard of precautions may be observed in all ships, and the Conference of 1929 recommended that every possible effort should be made with a view to obtaining an international agreement as to what goods are to be considered as dangerous goods and fixing uniform rules for the packing and storage of such goods (Safety Convention, Recommendation 5).

The Conference also laid down that the carriage of goods liable to endanger the lives of passengers or the safety of the ship was forbidden, and the Governments agreed to publish a list of dangerous goods, and to prescribe the precautions to be taken in the case of passenger ships (Article 24).

#### WIRELESS.

The group of services which we have just been considering secure that the ship shall be prepared beforehand to withstand the perils of the sea and of fire ; the next, wireless, enables ships to communicate with one another when at sea and so summon assistance and render assistance, when need arises. From the point of view of saving life there is probably no single thing which has been so effective. It is not possible to give the exact number of lives that have been saved by its means, but it is certainly very considerable, and the following figures, which show, for United Kingdom merchant ships, the number of lives lost at sea, crew and passengers, during the period when wireless has been coming more and more into use, tell their own story :—

Average of 5 years ending June 1914 = 1,004			
"	"	"	Dec. 1923 = 264
"	"	"	" 1928 = 193
			Year 1929 = 147
			" 1930 = 37
			" 1931 = 54

No reasonable man who bears in mind the great improvements of every description which have taken place in ships during this period would think of claiming that this great reduction in the number of lives lost is entirely due to wireless, but equally no one conversant with the subject would deny that wireless has been of the very greatest importance in producing this result.

For the purpose of saving life it is clearly desirable that as many ships should be fitted as possible, and curiously enough, the War, which destroyed so many ships and so many lives, helped in promoting this object. The International Conference of 1913-14 only felt able to propose that the largest ships, viz. those carrying fifty persons or more, should be compelled to be fitted, but during the War all British ships of any size had to be fitted with wireless for defence purposes, and in 1919 it was possible to provide by Act that all British passenger ships and all other ships of 1,600 tons gross and over must carry wireless. Foreign nations had not been through the same experience as we had, but there was a progressive realisation of the value of wireless for the ship's own business and for promoting safety, and it was in the end agreed, at the 1929 Conference, that all passenger ships and all other ships of 1,600 tons gross and upward should in future carry wireless. Exemptions are permissible where the shortness or nature of the voyage, the character of the ship or other cause, makes the fitting of an apparatus unreasonable or unnecessary, but the Conference endeavoured to keep these exceptions within narrow limits and it is left to each Government to decide whether it will, or will not, grant exemptions within these limits.

As 1,600 tons gross is the old traditional dividing line between the deep-sea ships and the others, it may be said, broadly speaking, that the rule now is that all deep-sea ships and all passenger ships must carry wireless; the number of ships which are fitted will in fact be larger than this, for many ships which are not compelled to do so carry wireless for their own purposes. Of the 3,700 United Kingdom ships which now carry wireless over 500 have been fitted voluntarily.

Wireless is of no use unless its message is received, and it happened fortunately that, by the time the Conference met in 1929, exhaustive trials made by the British and other Governments had established the fact that an automatic instrument can be produced which can be relied on to respond to the alarm and distress signals, and this greatly simplified the work of deciding how much watch each ship was to keep. For safety purposes all requirements would be met if every ship were provided with a wireless apparatus, an operator, and an auto-alarm, for these would enable her to send out her own call and be sure of hearing those of her neighbours. The auto-alarm

is a fairly recent invention, and it was not practicable to require it to be carried compulsorily, but its use is encouraged. If an auto-alarm is not fitted, passenger ships of 3,000 tons gross and over and cargo ships over 5,500 tons must keep a continuous watch; cargo ships from 3,000 to 5,500 tons must keep watch for at least 8 hours a day; and passenger ships and cargo ships of less than 3,000 tons must keep watch as required by their national authorities. The net effect of the Convention as regards wireless is to increase the number of ships fitted with the apparatus, and considerably to extend the amount of watch kept for the distress signal.

One or two other points in connection with wireless deserve to be noted. An operator on a cargo ship often has a good deal of time on his hands, and it would in many cases be more economic if the wireless work were carried out by one of the officers, but it is essential that the officer should possess and maintain sufficient proficiency not to be a cause of trouble to every one near him. It was not easy to settle what the standard should be, for it had to be low enough to be within the reach of the mate-operator and not so low as to lead to confusion in the ether. Eventually the Conference agreed to recommend a standard of 16 words a minute (Final Act, par. 1). It also agreed that distress, urgency, and safety messages should not be sent at a greater speed than 16 words a minute (Article 44).

Another thing to which the Conference attached importance was direction-finding apparatus, which tells the direction from which a wireless signal is coming, and so enables a ship to get her bearings or to steer straight for a vessel in distress. The use of this apparatus is increasing, and over 1,300 British ships have been fitted voluntarily; but the Conference thought it so valuable that it ought to be part of the compulsory equipment of every passenger ship of 5,000 tons gross and upwards (Article 47).

The use of wireless which this Conference had mainly in mind was in connection with distress, and a definite obligation is laid on the master of a ship which receives a distress signal to proceed with all speed to the assistance of the persons in distress, unless he is unable, or in the special circumstances of the case considers it unreasonable or unnecessary, to do so. The master of the distressed ship has the right to requisition such one or more of the ships responding to his call as he thinks best able to render assistance, and the others are thereupon released from obligation (Article 45). The alarm signal and the distress signal may be used only by ships in serious imminent danger which require immediate assistance (Article 43).

#### PROVISION OF BOATS.

The wireless provisions of the Convention apply to all classes of ships, cargo as well as passenger, and are expressly designed to promote general safety as well as the safety of the individual ship which carries the apparatus. The rules as to boats and as to subdivision, which is the next block to be dealt with, apply only to passenger ships, and are intended to promote the safety of those



ITALIA LINE'S CONTE DI SAVOIA.  
(Builders: Cantieri Riuniti dell'Adriatico, Trieste.)

1884

on board the individual ship ; moreover, bulkheads and boats only come into play after an accident has occurred, the bulkheads to keep the ship afloat after she has been holed, and the boats to enable passengers and crew to leave her. Both subjects attracted general attention at the time of the loss of the Titanic in 1912, for it seemed wrong that a new ship of the highest class should sink in 2 hours and 40 minutes when holed by ice, and equally wrong that in that space of time on a calm night all the passengers and crew should not be saved by boats. The public had been under the impression that there was a place in a boat for every one on board, and were indignant when they found that this was not so, the rules of the period only requiring the maximum number of boats which it was thought could be used in an emergency. In deference to public opinion, boats for all were placed on board all passenger ships, but it was not so easy to secure that all those boats should be available and capable of being launched quickly when the emergency occurred. Great improvements have been made since the time of the Titanic in davits and in all the other arrangements for launching boats, and it is now possible to say that, save under the worst conditions, every boat on board which is undamaged should be capable of being launched quickly. No one can say beforehand with certainty what will in fact happen in a given emergency, but while there are certain to be cases in which some of the boats cannot be launched, there will certainly be a proportion of cases in which every boat can be launched, and if that is so, it is only right that boats for all should be required. Here again, as in the case of wireless, the War showed what could be done ; the hospital ships Braemar Castle and Britannic were both torpedoed in November, 1916. The former had 493 persons on board and 488 were saved by boats, 400 of them being embarked in 17 minutes. In the latter 976 persons out of 1,065 were saved by the boats, all boats being got out in 35 minutes.

The Conference of 1929, therefore, had no hesitation in reaffirming the principle of boats for all ; indeed, they went beyond it by requiring that in addition, buoyant apparatus, in the shape of rafts which can be thrown into the water and can float clear when a ship goes down, shall be provided for 25 per cent. of the persons on board ; but they coupled with this the principle that all the boats and buoyant apparatus must be capable of being got into the water safely and rapidly, even under unfavourable conditions of list and trim, and it must be possible to embark the passengers in the boats rapidly and in good order (Article 13).

The Convention lays down detailed rules about the boats and other apparatus, into which it is not necessary to enter here, but a word should be said about the problem of the big boat, carrying 140 to 150 people, and weighing, when loaded, anything up to 20 tons, which has recently been engaging attention. All persons on board a liner could be provided for in a single row of these boats on each side of the ship, the embarkation would be effected a good deal more rapidly than with smaller boats, and the boats themselves would be more roomy and more seaworthy. On the other hand, they are more bulky and heavier than the ordinary boat, and the critical



questions were whether they could be got into the water safely in case of accident when fully loaded, and whether they could be got away safely from the ship's side. These questions have been very fully discussed in this and other countries, and the conclusion arrived at is that if proper provision is made in the construction of the boats themselves and of the launching apparatus they should be capable of being got into the water safely even under unfavourable conditions; it is also considered that, given proper construction and maintenance, motor engines can now be relied on to get the boats safely away from the ship's side. The Conference accepted these conclusions and allowed boats to be carried weighing as much as 20 tons when loaded with their full complement (Regulation XXIV).

The only other point that need be mentioned in connection with life-saving appliances is boat drill. Each passenger ship must have a muster roll allotting duties to each member of the crew in case of emergency, and musters of the crew for boat drill must take place weekly. A muster of the passengers must be held at an early period of the voyage if the voyage is to last more than a week (Article 25, Regulations XLIV and XLV).

#### SUBDIVISION.

The importance of boats is shown by the fact that in the year 1930 over 1,100 lives were saved in the boats of the ships lost; the importance of bulkheads cannot be measured in the same kind of way, but it is obvious that the more ships can be kept afloat after accident the less need will there be to take to the boats. Unsinkable ships, if they could be produced, would be so unworkable that they could not carry out the passenger and cargo business of the world, but it is possible by means of a proper system of bulkheading greatly to reduce the risk of sinking after accident, without materially impairing the usefulness of the ship. The problem has been to get the maximum amount of safety with the minimum loss of carrying power, and as different classes of ships had to be provided for, and a number of factors had to be taken into consideration, it was not an easy one. The system now adopted, which is the result of exhaustive technical inquiries extending over many years, requires ships to be as efficiently subdivided as is possible, having regard to the nature of the service for which they are intended, and the degree of subdivision required varies with the length of the ship and the service, in such manner that the highest degree of subdivision corresponds with the ships of greatest length primarily engaged in the carriage of passengers (Article 5). The pure passenger type of ship, if over 800 ft. long, must be able to float with three compartments flooded; if 450 ft. long, with two compartments flooded; and if 260 ft. long, with one compartment flooded. In the case of ships of the cargo type, the two compartment standard applies at about 790 ft., and the one compartment standard at 430 ft. In both types ships of lengths intermediate between the lengths given have to have a corresponding degree of subdivision or margin of safety. In ships of the mixed type the degree of subdivision

required is intermediate between that required in the passenger type ship of the same length and the cargo type ship of the same length. Detailed rules are given for determining the degree of subdivision to be required in each case, and for regulating such matters as the strength of the bulkheads, watertight doors, openings in the ship's side, etc. The rules apply in full to new passenger ships, and in the case of existing passenger ships which do not already comply with them, the subdivision arrangements have to be considered by the authorities of the country concerned with a view to improvements being made to provide increased safety where practicable and reasonable.

One very interesting provision in the sections relating to boats and subdivision is that which relates to pilgrim ships and other ships which carry large numbers of unberthed passengers in special trades (Article 4 (6) and Article 12 (5)). To enforce the full standard of the Convention on these trades would mean driving out the well-found steamers which are at present in operation, and leaving the pilgrims and other passengers, who must travel, but can afford only a very small fare, to the tender mercies of native craft; but it was felt that these trades, which are international, should comply with a uniform standard, to be settled by the Governments specially interested in them; that this standard should be set as high as practicable; and though the trades are local and special in character, their standard should be definitely linked up with, and related to, the general Convention standard.

Another interesting provision, which is found in both Conventions (Safety, Article 57 and Load Line, Article 18) is that which lays down that any fitting, appliance, or apparatus which is found on trial to be as effective as a fitting, appliance, or apparatus prescribed by either Convention, may be accepted in its place. This means that while the Convention lays down definite standards in different subject matters, any method of complying with these standards can be accepted if it is proved that it is really equivalent to the thing prescribed, thus preventing rigidity and leaving room for invention.

#### LOAD LINE.

Load line has hitherto only been referred to incidentally, and it was dealt with fully in the issues of this Annual for 1930 and 1931; but it is so important from the point of view of safety that the main features of the Load Line Convention should be stated here. As mentioned above, the load line survey is in effect the guarantee of the general seaworthiness of the ordinary cargo ship, much the most numerous class in the world, and the load line itself, as a loading mark, comes into operation every time that any of these cargo ships has a chance of loading anything like a full cargo. A very good summary of the main results of the Load Line Convention is given in the report of the British delegation (Parliamentary Paper Cmd. 3669), and the following paragraphs are quoted from it:—

The new Convention is an improved and extended version of the rules that have prevailed hitherto; it will make the rules in the different countries completely uniform, and it has a far wider application than the old system ever had.

The Conference contained technical and nautical representatives of all the principal maritime nations, and it is their considered opinion that the new rules are a marked improvement on anything which has gone before. In that opinion we concur, and we are satisfied that the new rules will raise the standard of safety of the merchant ship throughout the world. . . .

The outstanding points to which attention should be drawn are the emphasis that is laid in the new Convention on the protection of all deck openings and the safety of the crew, and the introduction, for the first time on British ships, of special load lines for timber ships and tankers. The extreme importance of protecting all weather deck openings in a ship against the sea in bad weather is recognised by all seamen, and the rules on this subject are made more definite and more emphatic than they have ever been before.

The experience of other nations has shown that under clearly defined conditions, ships carrying deck loads of timber, and tankers, can safely be allowed to load deeper than ordinary cargo ships; but neither the extent of the deeper immersion nor the conditions under which it can be allowed had been settled internationally. This has now been done for the first time. The deeper immersion of tankers and timber ships is a new thing so far as British shipping is concerned, and we would have preferred that it should have commenced on a rather more moderate scale than that indicated in the Convention until further experience had been gained on British ships. But we could not question the evidence brought forward by our foreign colleagues that their ships have for many years, with perfect safety, been allowed to load more deeply than is now permitted by the Convention; and the limits now fixed in the Convention are a compromise which was arrived at after very full discussion. In view of the conditions under which alone the deeper immersion is to be allowed, we think that compromise can safely be accepted.

The Convention establishes for the first time uniform loading rules for the ships of all nations; it lays stress on the importance of protecting the openings in ships and safeguarding the crew; and it will lead, we believe, to a closer and more uniform enforcement of the loading rules on all merchant ships throughout the world.

The technical provisions of the two Conventions are accompanied by a number of articles of a legal or administrative character, but for the present purpose it is only necessary to notice the provisions relating to certificates and to control of ships in foreign ports. Each Government which is a party to either Convention will see that its ships comply with its provisions, and will give them, or cause them to be given, a certificate, in an agreed form, to the effect that they have so complied; the other Governments will treat these certificates as having the same force as certificates granted by themselves to their own national ships. The extent to which Governments should interfere with foreign ships belonging to Convention countries was discussed at considerable length at the Conferences, as it is a subject on which views differ in different countries. In the end it was agreed that in general the duty of the authorities in a foreign port should be confined to seeing that there is a valid Convention certificate on board, and, in the case of load line, to seeing that the ship is not over-loaded; but, in order to provide for cases that will be very exceptional, these authorities may intervene if there is good reason to think that the ship, though provided with a certificate, is unable to proceed to sea without danger to human life. This should ensure that there will be the minimum amount of interference in foreign ports with the ships that comply with the Convention, but there will be supervision to prevent over-loading, and there will be interference in the rare cases in which this is really necessary for the purpose of saving life.

This concludes our review of the two Conventions, but it may be useful to add a few words about the Act by which they have been

approved by Parliament and as to the effect which the operation of these Conventions is likely to have.

#### LEGISLATION.

A great many of the provisions of the two Conventions could have been given effect to under the existing law, which is not surprising when one realises that the Convention standards are to a considerable extent the present British standards in an international dress; but some of the provisions clearly required fresh legislation, and it was not easy to decide what form that legislation should take. It was not possible to do here what is done in some countries, viz. pass a one-clause measure adopting the Conventions and leave it to the administration to draw up the necessary regulations; nor was it possible to have a simple Act applying only to Convention ships on the voyages covered by the Convention, for the present law would have to be retained for other ships, and that would have meant two codes in force at the same time; nor did time permit of the re-writing of the whole of the safety provisions of the Merchant Shipping Acts, so as to apply the new provisions to all ships. The only other possible course was the one adopted, which was to graft the provisions of the Convention on to the existing law. The existing law is contained in a number of Acts passed at different times, and the process of weaving into this fabric provisions applying to particular classes of ships of particular countries when on a particular class of voyage, and to them alone, has necessarily resulted in the Act being one of some complexity, and one which cannot be followed without repeated references to the earlier statutes. This was in the circumstances unavoidable, but as the new law makes little practical alteration so far as British ships are concerned, its administration should not cause any great difficulty.

When the Bill was going through Parliament a good deal of discussion took place over a proposal that was put forward on behalf of shipowners that the new Convention standards should, while the Conventions remained in force, be a maximum as well as a minimum. This proceeded from the very natural desire to secure as much stability as possible for the new standards, but, whatever may have been the merits of the proposal, it was certainly not what the Conventions intended, and was certainly never contemplated by the delegates at either Conference. The proposal therefore could not be accepted, but it, together with the question of helm orders, which was the only other point on which there was any controversy, was very fully discussed while the Bill was going through Parliament, and in the end the Bill in its present form, containing the two Conventions, was agreed to without a division.

#### PROBABLE EFFECT OF THE CONVENTIONS.

That Bill, and the Conventions which it contains, have now become law, and we cannot help asking ourselves whether the world is going to be any the better for it, or whether it is simply another

addition to the long list of paper reforms which increase work but produce no useful result. No one can say with any certainty, because everything depends on the spirit in which the Conventions are worked here and in other countries, and continual effort and watchfulness will be necessary to keep the right spirit alive.

No one who took part in the work of either Conference would dream of claiming finality or sacredness for any of its phrases or formulas, several of which were agreed to as compromises, and no one can be sanguine enough to imagine that the adoption of a series of common rules, expressed in English and in French, means that the day-to-day regulation of shipping in all the different ports of the world will necessarily be carried out with mathematical uniformity.

It can, however, be claimed, with all humility, but with great confidence, that something definite has been accomplished. The commercial elements and the Governmental elements in this and other countries have during recent years been working more and more closely together on this problem of safety, and each side has come to recognise that, while there is no such thing as absolute safety, it pays to have as much safety as economic working will admit; they therefore concentrate on, and co-operate in trying to solve, the minor but very difficult problem where the dividing line should be drawn at a particular time with regard to a particular kind of ship. If the load line, for instance, is too lenient, there will be deck damage and loss of life, apart from the risk of total loss, and it is quite possible that owing to delays and reduced speed the ship will not in the course of the year carry the aggregate amount of cargo she should have done. On the other hand, if the load line is too severe, cargo is shut out which could quite properly have been carried, and the cost of sea transport is unnecessarily increased to all consumers. Only co-operation between the interests concerned can determine where the different dividing lines between safety and economic working should be drawn at any particular moment. The Conventions are the outcome of such co-operation; and the co-operation which produced the Conventions is likely to increase rather than diminish. In the same way, the co-operation between the maritime nations on subjects of safety, which also is embodied in the Conventions, is likely to increase, because people now see that it pays, and that conviction will not disappear, but will grow stronger. Once it is realised, as it now is, that ships are the same all the world over, whatever coloured flag they fly, and that the best way of combating the forces of Nature is by world-wide co-operation, Nature will do the rest; for she will very soon show us whether the rules we lay down are economically and technically right or not. The efforts of all concerned must inevitably, as time goes on, be directed more and more towards finding out what Nature, physical and economic, really wants and shaping their course accordingly. This is the main idea embodied in the Conventions, and it is because of this that there is reason to think that their influence will last. The actual rules which are included in the present Conventions are good, as good as hard work on the part of all concerned could make them, but they will necessarily in due course be superseded by better

ones as further knowledge and experience are gained. Nevertheless, the foundations now laid will be useful to those who come after.

The cynic may smile at humanity making these international agreements about shipping just at the time when the spirit of nationalism, by continually increasing tonnage irrespective of the real demand for it, has depressed shipping to its lowest point ; but the argument can just as easily be turned against him. The fact that, in spite of all that the great and useful but sometimes erratic forces of nationalism can do—and nothing excites people quite so much as a flag—it has been possible to make an international agreement on shipping which embodies so much common sense that it is almost sure to last, gives reason to hope that common sense may in time prevail in other international fields.

CHARLES HIPWOOD.

## CHAPTER X.

### THE NORTH ATLANTIC PASSENGER TRADE.

THE broad facts which emerge from an examination of the present position of the North Atlantic passenger trade show that this important section of ocean transport is in a state of arrested development, as judged by volume of travel, and also that the shipping lines concerned are engaged in an intensive struggle to secure as large a share as possible of the business offering, especially that of the more remunerative luxury class. The following survey reviews some of the factors which have tended to bring about the present situation and alludes to some of the competitive influences at work and their probable effect upon the future of the trade.

The history of North Atlantic shipping has often been cited as proving that international trade and travel increase in direct ratio with the improvement and extension of the facilities provided. There can be no question that the supersession of sail by steam and the paddle by the screw, the multiplication of steamships and the raising of the standard of comfort for voyagers, have popularised the ocean journey between Europe and America, and thus assisted very materially in swelling the volume of travel between the two Continents. The teachings of the post-War period, however, have made it clear that other determining factors, mainly economic, have to be recognised besides the provision of speedy, comfortable, and reasonably-priced ocean transport.

The present century opened badly. The year 1899 had been a poor one; the total number of passengers carried east and west across the North Atlantic was only three-quarters of a millions and international competition was very keen. There was a little improvement during 1900, followed by alternations of good periods with bad such as are an inherent feature of the trade. The peak was reached in 1913, when the westward passengers from the United Kingdom and European countries to North America numbered 111,078 first class, 341,878 second class, and 1,405,649 third class, a total of 1,858,605, the number of sailings being 2,043. The eastward movement was 719,081, making the total passenger traffic 2,577,686. During the War communications were naturally restricted, the worst year being 1918 when the westward sailings were limited to 308 and the number of civilian passengers using the "Ferry" east and west did not reach 100,000. In 1920 conditions were gradually approaching the normal, for the sailings from Europe to America were increased to 806, and the passengers carried were 74,416 first class, 193,000 second, and 614,715 third, a total of

882,057, many of whom had been held up awaiting transport. The promise of that year, however, has not been fulfilled, as will be seen from Table I, which gives particulars of the westbound business during the past decade. In this Table the totals of second-class passengers from 1923 onwards include those who travelled in the superior class of "cabin" ships, the numbers in 1930 and 1931 being 84,779 and 49,486, against 54,244 and 28,654 who used the old-established second class. The rapid advance in tourist business furnishes an example of the changes which have been introduced into the North Atlantic trade and the enterprise of shipowners in endeavouring to make good the loss of revenue due to the decline in emigrant traffic.

TABLE I.—TRAVEL FROM EUROPE TO AMERICA, 1922-31.

Year.	No. of Sailings.	Passengers.				Totals.
		First-class.	Second-class.	Tourist.	Third-class.	
1922 . .	1,169	80,855	204,631	—	284,691	570,177
1923 . .	1,289	83,686	276,362	—	475,014	835,062
1924 . .	1,319	89,247	208,777	—	234,755	532,779
1925 . .	1,395	92,151	227,302	12,163	248,563	580,179
1926 . .	1,237	95,364	217,940	37,672	312,123	663,099
1927 . .	1,262	99,857	207,038	74,664	339,517	721,076
1928 . .	1,358	98,128	192,016	97,010	340,580	727,734
1929 . .	1,344	99,237	182,553	116,319	345,509	743,618
1930 . .	1,403	82,269	156,652	138,737	259,084	636,742
1931 . .	1,171	62,963	88,542	100,412	113,275	365,192

Comparison of 1913 with 1931 shows that westbound traffic in the latter year was less than 20 per cent. of that in the year preceding the outbreak of the War, and the proportion of third class only 8 per cent. For both westbound and eastbound traffic combined the 1931 total of 817,669 contrasts very poorly with the 2,577,686 of the former year, being, in fact, only 31 per cent. of it. Another disquieting feature is the fact that the third-class passengers brought to Europe from America during 1931 exceeded the number carried outwards; the figures, 113,275 outwards and 207,162 inwards, indicate that conditions in America were such that former immigrants were finding it advisable to return to the United Kingdom or Europe, for the sake of the lower cost of living, and live there pending the return of better times. As many of these visitors travelled on return tickets they should swell the outward returns when the commercial barometer rises.

#### EMIGRANT TRAFFIC.

The lifting of the widespread trade depression, though it will speedily send up the returns of the shipping companies, will not restore the emigrant traffic to the important part it formerly played in the economics of the North Atlantic trade. The days when third-



class accommodation was packed to the utmost and the lines had waiting lists of would-be travellers to the west are gone, and according to present indications will never return. During the quinquennial period 1910-14 the average yearly immigration into the United States was 1,035,000, of which total the United Kingdom supplied 89,000, Germany 32,000, Scandinavia 36,000, Italy 221,000, Russia 211,000, and Greece, Rumania, Turkey, and Portugal 69,000. For many years, however, there had been powerful interests in the United States which were keenly opposed to unrestricted immigration. At the termination of the War this attitude was strengthened by a general feeling that the country might be overrun with refugees from Europe, and also by the fact that the non-assimilability of certain nationalities already in the United States had been a source of weakness to the Government during hostilities. This position was the opportunity of the advocates of restriction, who were aided in their efforts by the labour forces which contended the wage standard would be lowered were the influx of workers from abroad unchecked.

In 1921 the question was considered of such national urgency that the Emergency Quota Act was passed by Congress, and this, as amended in 1924, is the law upon which is based the United States immigration policy of to-day. The reduction of imported labour brought into operation a movement for greater mechanisation of industry, for never in the history of the world had the inventive genius of man such a golden opportunity of asserting itself as in the United States during the early post-War period. Production was multiplied and cheapened, and the Republic was enabled to take the leading part in supplying world requirements, while her European competitors were tardily recovering from war exhaustion. The economic boom was, however, followed by the disastrous reaction of the closing months of 1929, despite the fact that "the American worker was protected from the crisis threatened by the annual invasion of close on a million people." In that year the immigration laws were again revised, and the numbers of incomers from European States were fixed as shown in Table II.

TABLE II.—UNITED STATES IMMIGRATION QUOTAS.

Austria . . . . .	1,413
Belgium . . . . .	1,304
Czechoslovakia . . . . .	2,874
Denmark . . . . .	1,181
France . . . . .	3,086
Germany . . . . .	25,987
Great Britain and Northern Ireland . . . . .	65,721
Irish Free State . . . . .	17,853
Italy . . . . .	5,802
Netherlands . . . . .	3,153
Norway . . . . .	2,377
Russia . . . . .	2,784
Sweden . . . . .	3,314
Switzerland . . . . .	1,707
Total . . . . .	<u>138,556</u>

There are other European states with smaller quotas than those listed, some of them being limited to 100. In the aggregate they allow for about 5,000 immigrants, and thus the number of new-comers from Europe allowed to enter the United States each year is brought up to 144,000, a number which will not go far in filling the accommodation which the shipping lines have provided for this class of voyager.

With regard to Canada, the official figures for the fiscal year 1931 give the total of immigrant arrivals as 88,233, or deducting 24,280 who came from the United States, 63,953, of whom 27,584 were from the United Kingdom and 36,359 from Europe, figures which mark a big decline from the 150,000 and 113,000 of 1913. The present attitude of the Canadian Government towards immigration is defined in an Order in Council passed in August, 1930, when it was decided, in view of growing unemployment and the critical position of agriculture, to adopt a restrictive policy. Under the order then made, all immigration except that of British subjects from the Mother Country or self-governing Dominions, and United States citizens coming from the U.S.A., was limited to two classes—wives and unmarried children under 18 joining heads of families established in Canada and in a position to support their dependants, and agriculturists with sufficient money to begin farming. At the same time a policy of "no solicitation" was inaugurated, and no immigrant of any nationality was allowed entry unless he was in a position to support himself in case of failure to find employment. The door was further closed by the efforts of the authorities to secure what work was available on the land for the unemployed in the manufacturing industries. At present, therefore, the flow of people from Europe to Canada is seriously checked, and this fact, with the increasingly stringent quota limitations of the United States, points to a greatly diminished demand for the facilities provided by the Atlantic steamship services.

#### THE COMPETING FORCES.

In 1913 the shipping engaged in the transportation of passengers between Europe and America aggregated 2,299,726 gross tons. To-day it is somewhat less, the gross tonnage of all the ships in operation in October, 1932, being 1,949,990 tons. This figure does not include the recent Italian liners *Rex* (51,062 tons) and *Conte di Savoia* (48,500 tons), vessels which by reason of their high speed and sumptuous accommodation may divert travel from the British and Continental lines serving Northern Europe.

Of the total tonnage engaged in 1932, a little less than half, 905,456 tons, was under the British flag, while 367,486 tons was owned by the North German Lloyd and Hamburg-Amerika Companies. The magnitude of the German tonnage is remarkable considering that these undertakings were deprived of their fleets, both in being and under construction, at the conclusion of the War, while equally striking is the fact that in 1931 the N.D.L. carried more westbound passengers than the Cunard Line, though its tonnage

was only 230,092 against 314,454. In some measure the explanation is to be sought in the drawing power of the Bremen and Europa, the large number of voyages made, and the fact that the services tap three ports on the European side of the Atlantic.

During 1931 the Continental and United States lines carried a total of 173,367 westbound passengers, compared with 134,759 in British ships. These figures show a heavy decrease from those of 1930, but while the British drop was over 50 per cent., that of their rivals was only  $33\frac{1}{3}$  per cent., and again the Bremen and her sister ship were no doubt partly responsible for the smaller decline. From the point of view of revenue the position is perhaps worse than these figures indicate, for the totals include passengers to Canada as well as the United States. That the British Conference lines carried 51,778 to the Dominion and the Continental Companies only 2,652, seems to indicate a concentration by the latter on the New York service and the wealthier traffic which follows that route.

It is an obvious corollary of the restricted emigration to North America that competition for the higher-priced travel will be keener than ever, and it is interesting to consider how the British lines are equipped for the struggle.

In the North Atlantic trade there are over a dozen ships, seven of them German built, which by reason of their size, speed, and luxurious accommodation make a special appeal to the passenger of means. They are the three express steamers of the Cunard Line—Berengaria (52,226 tons), Aquitania (45,647 tons), and Mauretania (30,696 tons); the similar trio under the White Star flag—Majestic (56,621 tons), Olympic (46,439 tons), and Homeric (34,351 tons); and the Empress of Britain (42,348 tons) of the Canadian Pacific. In opposition to them are the Ile de France (43,153 tons) and Paris (34,569 tons) of the Cie. Générale Transatlantique; the Leviathan (48,943 tons) of the United States Lines; the Rex and Conte di Savoia of the Italia Line; and the Columbus (32,565 tons), Bremen (51,656 tons), and Europa (49,746 tons) of the N.D.L. The competitive power of the British ships is not so strong as it may appear at first sight, as some of them are long past the first flush of youth. The Empress of Britain came out in 1930, but the Olympic dates back to 1911, the Berengaria to 1912, and the Aquitania to 1914, while the ex-record holder, the ever-green Mauretania, has 25 years of hard service to her credit. Of the foreign luxury ships the oldest is the Paris, built in 1921; the Europa and Bremen were completed in 1928 and 1929, and the Rex and Conte di Savoia in the autumn of 1932. In addition to these there is a ship of 75,000 tons building for the C.G.T. She should come into commission early in 1934, and then, if the performance of the new Italian flyers confirms the expectations of their owners and builders, there should be five ships plying on the Atlantic, each faster than the Mauretania, if she is then afloat, and each under a foreign flag. The Mauretania is certainly overdue for replacement, for she has passed the allotted span of Atlantic liners, and the Cunard Company decided five years ago to build a pair of 73,000 ton vessels of such

speed as would enable them to maintain the weekly service between Southampton and New York at present carried on by three ships. Considerable progress has been made with the first, £1,500,000 having been spent on her, when in December, 1931, work was suspended, pending financial arrangements for her completion and the construction of her sister. It must be some years, therefore, before there is a chance of regaining speed supremacy on the Atlantic for British shipbuilding and marine engineering.

#### RATIONALISATION.

Meanwhile the insistent problem is how best to carry on until such time as there is a general trade revival and conditions become more normal. At present the accommodation provided is admittedly considerably in excess of travel requirements, whether of the luxury, emigrant, or intermediate classes, and hence the proposal of a drastic policy of withdrawing superfluous tonnage until times improve. The proposal, however, is not so simple in practical application as it may appear. A high-class passenger vessel, if she is to escape serious depreciation, requires close care and attention when laid-up and an expensive overhaul on resuming work. In such a case, too, trained staffs accustomed to the ship are dispersed, and with new crews the service may not be kept up to the standard and the reputation of the line may suffer. It is quite understandable, therefore, that many owners hold the view that it is better to keep a ship running as long as possible, even though there may be no profit in so doing. Any plan of rationing which is to be comprehensive and effective must necessarily include all the lines and also provide for the compensation of owners whose ships are retired, and no such scheme has been put forward in the Conference of the North Atlantic British and Continental passenger lines. Incidentally it may be pointed out that considerable misapprehension exists with regard to the functions of the North Atlantic Conference. It includes 17 lines, the representatives of which meet at regular intervals to exchange views and discuss business arising from the work of the Conference, in grading ships according to their size, speed, etc., and fixing in detail the rates which each vessel is to charge for her accommodation. But there is no pool defining the activities of the various lines, nor any arbitrary determination of spheres of influence, as was strikingly illustrated when the United States Lines decided to make Bremen the terminal port of the *Leviathan* on her eastern trips. The British lines have their own conference for domestic matters, and the same arrangement is followed by the Continental companies.

Though no collective action has been taken, individual lines have recognised the advisability of eliminating unremunerative sailings and generally economising so far as compatible with the maintenance of regular, frequent, and efficient services. The adjustment of the sailings of the big ships of the two premier British lines is a case in point. A far more widely reaching scheme was that which contemplated the merging of the Cunard and White Star interests on the Atlantic, despite the involved nature of the ownership of

the latter, its liabilities to shipbuilders for new tonnage, and its commitments under the Trade Facilities Acts. The economies which might have resulted from such an amalgamation are obvious, but in the sequel it was not carried out.

The scheme of the Hamburg Amerika Line and the North German Lloyd aims at securing complete co-operation between these long-standing rivals, and at the same time maintaining the individuality of each organisation. Sailing schedules will be adjusted to the common advantage; travel bureaux, agents, and representatives at home and abroad will act for both companies; new construction will be agreed jointly, and profits will be so apportioned that each undertaking makes equal provision for dividends, reserves, and depreciation. How the plan will work out under the test of practice remains to be seen, but it is clear that enormous economies are possible, while the competitive power of the lines on the Atlantic will in no way be impaired but rather strengthened.

From this brief survey it is plain that the North Atlantic passenger trade has experienced the full force of the economic depression which has adversely affected communications between the nations, and also that the British lines have suffered from the restricted movement of peoples to a greater extent than the Continental. It would also appear that British prestige on this important ocean route is seriously challenged. History, however, is only repeating itself, and as British shipping has played the dominant part in linking Europe with America from 1840 onwards, the hope is encouraged that the present set-back may prove only temporary.

RICHARD BEYNON.

## CHAPTER XI.

### THIS CRUISING.

Two years ago a chapter in "Brassey" entitled "The Ocean Tourist" surveyed the rapid increase of ocean travel which the shipping companies were fostering to recoup themselves for the loss of passenger business in other directions. The tourist third-class, for example, was introduced on the North Atlantic in an effort to utilise the third-class accommodation which was nearly empty for most of the year because of the restriction of immigration into the United States and the lessened desire of Europeans to seek their fortunes in Canada. Similarly, the economic clouds on the horizon in Australia were convincing owners of ships running there that a new type of traveller would have to be sought in order to make up, so far as possible, for the absence of emigrant travel to the Antipodes.

These changes involved the introduction of a rather higher standard of accommodation, a task which has been comparatively easy, thanks to the liberal choice decorators have to-day of panelling of light weight, easy application, and pleasing appearance. The various forms of ply-wood and fibrous board, coupled with modern painting methods with cellulose paints and spraying devices, have converted ordinarily humdrum surroundings to an effect of brightness, making them pleasant to the eye and masking the cold steel-work and piping which gave such a cheerless aspect to the old third-class quarters. Inexpensive partitioning has served to fabricate cabins of reasonable comfort and privacy. A very little more money and, perhaps, a little more thought (which might have been expended years ago) in the choice of furniture have sufficed to create a new atmosphere, so that the old drab third-class is now a thing of the past. In special cases where, with an eye to the future, owners have foreseen the possibilities of extensive cruising hot and cold running water is to be found in the cheapest of third-class cabins, a refinement which has its undoubted attractions to-day, and which will be of greater benefit should the vogue of cruising extend still farther.

Side by side with these improvements in the cheapest class there has been a lowering of fares. These changes, coupled with the substitution of tourist third for second-class, the extension of the cabin class to more lines and so on, have, in effect, raised the general standard of travel accommodation. Even the less enterprising managements are coming into line.

Last year, when Atlantic rates were reduced, the title "tourist

third-class " was dropped and " tourist class " substituted. This in itself was a change of no mean significance, since strong opposition to the introduction of a tourist class at all was overcome only by the retention of the appellation " third " which it was felt would induce the more sensitive to travel a class higher. By experience, and the competition of certain lines, however, it has been shown that there is a large public content to travel under the conditions to be found in this class because the standard of comfort is adequate and the price suits their purse. On other routes, such as the Australian and the Indian, the tourist class was created as such, and the word " third " never embodied from the commencement.

Undoubtedly this development has done a great deal to stimulate travel, especially where the voyagers have time to spare. The ordinary, it might almost be said the standard, cruises such as those to the Norwegian Fjords meet the requirements of those who can allow themselves only about a fortnight away. The longer luxury cruises, varying from a month to " round-the-world " during the winter, have attracted a fair number of travellers, although not so many as they did a few years ago.

The great movement, however, which was not foreseen and which has provided employment for a number of large passenger ships has been the creation of a new type of cruise appealing to a class which probably had never before thought seriously of going on a long sea journey. The impetus came from such a remote cause as this country going off the gold standard and the wave of patriotism which found expression in the " Buy British " movement. Thousands of people, partly because of the application of this slogan to travel, but mainly for financial reasons, found themselves cut off from those near-by Continental seaside resorts, notably in Belgium and France, which provided at cheap rates a holiday with all the allurements of a foreign atmosphere and complete change of scene. The extent of the transfer is manifest from the reduced bookings last summer on the cross-channel steamers.

This altered outlook on the part of British holiday makers coincided with a severe slump, on the North Atlantic particularly, although other routes also suffered very seriously. Shipping managements, in deciding to try a few extra cruises, found a public more eager and responsive than the most sanguine had dared to anticipate. So the public palate was tickled in every conceivable way. Big mail carriers were put on week-end cruising. The week-end trips from American ports, sandwiched in the turn-round, served the dual purpose of giving the passenger a breath of sea air and emancipating him from the restraints of the Volstead Act, and they were followed by an equally strenuous time at the eastern terminals, where remarkable feats of preparation and revictualling were performed in order that revenue might be obtained to make up for that lost on the ordinary services. Some of these trips must have been a triumph of organisation, but the strain on human endurance was severe and tempers were sometimes frayed.

Sometimes, too, the glamour of the ocean, described with all the arts of the advertising expert, and the sparkling sea and glorious



CIE. GÉNÉRALE TRANSATLANTIQUE'S LINER CHAMPLAIN.  
(Builders, Forges et Chantiers de Saint-Nazaire, Penhoët.)





sunshine of the posters were found to be illusory where the week-end long-distance cruises coincided with the inhospitable moods of the Bay of Biscay. For this reason the week-end cruise has not been an entire success. It is at best a gamble with the elements. Shipping managements, in the cold deliberation of later experience, may decide that the opinions of a thousand optimistic but disappointed travellers may have as much cogency of reason—and as much influence on their friends—if they have had a buffeting and not cloudless skies and uninterrupted sunshine.

A holiday abroad at £1 (sterling) a day has its attractions, not the least being that, except for a few shore excursions and cocktails, the fare is inclusive. There is no supplementary charge for the cinema, for concerts, for afternoon tea, or for all the odds and ends of petty disbursement which fritter away so much money at the seaside. The spectre of the deck-chair man with his tram ticket and clinking bell device, mounting up twopences and threepences for listening to a band which fades away at the first shower, does not worry the sea traveller. The importunities of the burnt-cork complexioned mendicant, and the annoyances of the sand artist who appropriates the choicest portion of the beach, are left behind with the perplexities of varied licensing hours. On the contrary, the voyager may beg to be saved from his friend the steward, who, at odd intervals of the day would make him break all dietetic precepts by eating, free of charge, bouillon, ices, or the dainty confections which are thrust upon him by the hospitality of the shipping line in whose vessel he has embarked.

Orchestral music, carnival dances, and gala dinners are part of the life of the ship offered without stint or favour and included in the modest passage money. Comparisons with what such attractions would have cost at the ordinary seaside resort are obviously in favour of the ocean cruise.

The popularity of the cruises and the haste of shipping companies, without much forethought or experience, have sometimes led to the acceptance of larger numbers of passengers than could conveniently be handled. A first-class cruise to many is a cruise with all the amenities of first-class accommodation. Some of these may be waived and inferior class cabins accepted with resignation in consideration of the cheaper fares paid, but wives and daughters in particular resent being relegated to the second-class or third-class dining-saloon. No tact, however skilfully applied, can entirely overcome the bald fact. Obviously, all cannot get into the first-class unless several sittings are arranged—an expedient which is tedious and undesirable. At least one company has sought to palliate the invidious distinction by making the captain and the chief engineer alternate. Thus, one night the captain dines in the first saloon and the first engineer in the after saloon, while next night their positions are reversed.

Is what has been described as a whirlwind cruise from breakfast to midnight what the traveller really desires? The question has often been asked and is difficult to answer. Ordinary voyagers, many of whom are seriously business minded, are content to make

the journey in quietude, in a deck chair with a few good books. The average "cruisist" expects to be entertained. He, or she, thinks, as a matter of course, that if there is a concert in the social lounge he, or she, can get a place, though in a ship packed to overflowing the room may be able to hold barely a quarter of the passengers. This shows how difficult it is to arrange these functions with a North Atlantic mentality. The task of the entertainers will, in future, need to be directed to this weakness, which showed itself during the busiest of the cruising periods. The fact is that every one went in the belief that, if he or she wanted it, the tip-top entertainment of the day would be available and accessible as a matter of course. Such an achievement is impracticable, and alternatives will have to be sought. Many of those who now go cruising are of the new generation which seems incapable of amusing itself, and a wireless entertainment, known to be the same as the others are having on shore in the monotonous old boarding-house, is not that for which they go down to the sea in ships.

The lover of the sea who for years has longed to go in a tramp or a sailing ship may find these artificial attractions uncongenial. The cruise is hardly likely to satisfy his yearnings for a real taste of salt atmosphere, and he had perhaps better be allowed to go elsewhere.

Admittedly these ten-, twelve-, or fourteen-day cruises were hastily improvised, and a great deal had to be offered for low inclusive fares. The ships could not be selected entirely for their suitability. Running into heat waves in a ship built for cold latitudes is no joke. The ships employed were merely those that could best be spared, and when the season ended shipping managements had time to take stock of the situation. They may, to-day, be wondering whether this particular form of holiday cruise has come to stay. If so, they must seriously be asking themselves whether, when ordinary travellers come back and the ships are wanted for their normal services, the cheap rates can stand, and, if not, will the cruise enthusiasts depart for other amusements. By that time, however, a new technique of catering and entertainment will have been established, and the short-term, low-fare holiday cruise will have found its own niche in the vast cruising business which now plays so important a part in the economics of shipping.

VIATOR.

## CHAPTER XII.

### THE ROYAL MAIL STEAM PACKET COMPANY.

BEFORE the coming of steam the King's mails were carried in the King's ships, generally in the notorious old ten-gun brigs. The advent of steam, however, suggested the possibility of regular despatches to all the principal oversea countries. A vast naval extension in order to cover these fresh services was neither desirable nor possible, and in the preamble to the Royal Charter of Incorporation of The Royal Mail Steam Packet Company, granted on September 26, 1839, it is stated that "it is considered that it will be for the advantage of the public service that such steam and other vessels should be furnished through the medium of merchants and other persons of capital."

The ambitious intent of the Company, there is little doubt, was to undertake the general ocean mail service of the British Government to all foreign countries. The Charter was certainly indefinite enough to make this project possible. The actual stipulation was that the Company should transmit the mails "to and from Great Britain, the West Indies, North and South America, and such other foreign parts as the public service may require."

It is difficult now to recapture the pioneering boldness of the venture. The difficulties were so immense that the West India mail contract alone absorbed all available energy. The contract stipulated regularity, and ships sailed out of Southampton in regular turn according to schedule. But as likely as not nothing was heard of them at headquarters until they were once more off the home port. The steamship was still in its experimental stage, and an accident or unavoidable delay at sea threw the whole sailing schedule into confusion. There were no telegraphs; coaling and repairing stations were few, and neither sailors nor engineers were adept in the new medium.

In 1840 the first contract was entered into as between the Company and H.M. Government for a period of ten years. The Company undertook to provide a fleet of reliable and speedy steam vessels which would give a regular means of communication, develop traffic, and otherwise promote the interests of Great Britain, besides establishing a regular mail service. In consideration of this last service the Company was to receive an annual payment of £240,000. Through unavoidable delay in completing the necessary vessels the contract did not actually come into force until January 1, 1842.

The contract itself is a curious document. It was entered into, not with the Postmaster-General, but with the Lords Commissioners

for executing the office of Lord High Admiral of Great Britain and Ireland. They enjoined the maintenance of a fortnightly service to Barbados, and thence to other West Indian ports. From several of these ports of call subsidiary steamships were to be despatched in connection with the arrival and departure of vessels from and to Southampton. An important clause in the contract was that "the new mail steamers should form portion of a fleet of large and strongly built merchant steamships, which, in the event of war, could be made auxiliary to the ships of the Royal Navy." All the ships had to be strong enough, if necessary, to carry guns of the largest weight and calibre then in use at sea. The warships of those days, with their wooden hulls, were no less vulnerable than the merchantmen, and thus in effect the contract meant the addition of 14 capital ships to the strength of the Royal Navy. Another item in the contract entailed the free carriage of an Admiralty agent in each vessel, a boat and crew being told off for his use in landing and discharging mails.

#### THE FIRST FLEET.

The first chairman of the Company was John Irving, M.P., with Andrew Colville as deputy-chairman. The Company had an authorised capital of £1,500,000, in 15,000 shares of £100 each, and began operations on an exceptionally large scale. No fewer than 14 powerful sailing vessels with steam auxiliary engines were at once ordered for the service. These vessels, as stipulated in the contract, had engines of not less than 400 nominal horse-power, and all were built under the inspection of an Admiralty surveyor. Like all ocean-going vessels of the period, they were of wood, and were propelled by paddle wheels. They had spar decks with a promenade for passengers, and main and lower decks for sleeping and saloon accommodation. Upon delivery of the vessels the contract required one of them to sail twice in each calendar month from England *via* Corunna and Madeira to the various islands in the West Indies, and back "to such port in the British Channel as the said Commissioners of the Admiralty shall direct."

The first vessel to take the water was the *Forth*, launched on May 21, 1841, by Messrs. Menzies, of Leith, but the first to sail under the mail contract was the *Thames*, constructed at Northfleet by Messrs. Pitcher. She left Falmouth on January 3, 1842, and was followed at intervals of a fortnight by the *Dee*, *Medway*, *Teviot*, and *Trent*. All the vessels returned to Southampton, which was then entirely devoid of dock accommodation. The growth of that great port is indeed closely linked with the operations of the Company.

Owing to a number of uncontrollable difficulties, the service was not at its inception as regular as the directors desired. It is true that a very few months saw many improvements, but the fleet was as yet not large enough to undertake the full terms of the contract, and a larger expense had been involved than was covered by the payment of £240,000, the return from passengers, and freight. In consequence the first year of working resulted in a heavy loss. The

balance sheet at the first meeting of shareholders showed a deficit of £79,790 16s. 8d. One-half of the share capital had already been called up before the meeting, and the shareholders sanctioned another call of £10 a share. But even so, it was found that there were not sufficient funds to meet current needs, and the directors appealed to the Government for further assistance. The Government agreed to reduce the stipulated annual mileage of the Company's vessels from 684,816 miles to 392,976 miles, and this without any reduction in the annual payment. The directors thereupon estimated a saving to the Company of £125,000 per annum, but unfortunately the Government's action was more than counterbalanced by the loss of two vessels. In 1843, however, there was such a rapid increase of trade that the Company recouped its losses and had a surplus of receipts over expenditure of £94,210. This was increased in 1844 to £147,749. The Company was certainly unfortunate at the beginning, for during the first eight years of its life it lost no fewer than six of its steamers.

It is a matter for pride that the Company should have been the first to realise the enormous possibilities of Panamá, and that it should have laid, however modestly, the foundations of trans-Isthmian transport. No connection between the two seas existed, but the Company, with admirable foresight, organised in 1846 a regular service by mule and canoe across the malaria-ridden spit of land. At that time the Pacific Steam Navigation Company was running several services to the west coast of South America. The first result of the Company's overland route was a Government contract with the P.S.N. to carry the West Coast mails delivered by the Company's service to Colón.

In those days the great railways which now span the United States between New York and San Francisco had not been built, and during the gold rush of 1848 a motley crew of adventurers made use in great numbers of the Company's route to California across the Isthmus of Panamá. But the recently organised transit proved inadequate. The Panamá Railroad, projected in 1850, received substantial pecuniary assistance from the Company, and after five years of bitter struggle against difficulties was opened in 1855. The impetus thus given to trans-Isthmian transport resulted in the extension, in 1868, of the itinerary performed by the main transatlantic steamers of the Company direct to Colón, thus avoiding the transfer at St. Thomas to intercolonial steamers. Some years later Ferdinand de Lesseps travelled by one of the Company's steamers to Panamá to survey the canal.

#### BRAZIL AND ARGENTINA.

July 5, 1850, is a landmark in the history of the Company, for it was on that date that it entered into a contract with the Government which extended its activities considerably and brought it for the first time into contact with both Brazil and Argentina, an event which has proved as fruitful to those countries as it has to the Company. This contract came into operation on January 1, 1851, and

was for a period of ten years. The payment was raised to £270,000 per annum, but the Company was asked to undertake, in addition to its previous services, a monthly voyage to Brazil and the River Plate. The terminal port was Rio de Janeiro, but subsidiary ships voyaged thence to the River Plate. The annual mileage was thus increased from 389,448 to 547,296, and the mileage rate reduced from 12s. 3d. to 9s. 10d. a mile. The Company also undertook to increase the speed of its steamers on the West Indian route from 8 to 10 knots, and to add to the fleet five new steamers, each of 2,250 tons burden and 800 horse-power. The new service to Brazil and the Plate was opened by the Teviot, followed by the Tay and the Medway.

The Crimean War broke out in 1854, and during the next two years no fewer than seven of the Company's steamers were chartered by the British Government as transports for troops and stores to the Black Sea. In Crimean days the supply of steamers was so short that large bodies of troops had to be sent out in sailing vessels, many of which, at one point or other of the voyage, were fortunate enough to be towed by one of the West India mail steamers. During one trip alone the Trent towed 70 sailing ships. When under charter at this period the Orinoco distinguished herself by making the passage from Southampton to Malta in what was then considered the very short time of nine days. The French Government chartered the Parana to convey troops from Toulon and Marseilles to the Black Sea, and at the close of hostilities the Company was highly commended by both Governments for its excellent services.

The desire for speed, and yet greater speed, is not so modern as is sometimes supposed. Almost all the contracts entered into between the Company and the Government lay great stress upon regularity and rapidity. When the contract of 1850 was extended in 1858 for a further term of two years, it was urged that the mails between England and the West Indies and Rio de Janeiro should be speeded up. The Company spent £400,000 on four new steamers immediately, three of 3,000 tons burden each, with a fourth, of smaller dimensions, to ply between Rio and the River Plate. The result was that the West Indian mail service was reduced from 59 to 42 days, and that to Rio de Janeiro from 66 to 59 days, a truly fine achievement when all is considered.

In the same year, 1858, on the failure of the European and Australian Mail Company, the Company agreed to continue the Australian mail service and entered into a mail contract for eight months. The payment for this service was at the rate of £185,000 per annum, giving a monthly sailing. In certain circumstances of loss in working there was a proviso for a monthly indemnity of £6,000 in addition, and the difficulties of this service are shown by the fact that the Company received about £60,000 under this head in 1860 and 1863.

After 1863 the mail contracts were entered into by the Postmaster-General, and not by the Lords Commissioners of the Admiralty. The result was a serious diminution in the amount paid. From January 1, 1864, for example, the Company's contracts

were again renewed, but the payments for the West Indian, Brazilian, and River Plate services were reduced by no less than £68,000.

#### SPEED AND ECONOMY.

It is possible that such niggardly contracts as these were in part responsible for the great advance made during this period in ship-building. The demands for economy were urgent, and by 1867 vessels were being constructed on greatly improved principles. A large saving in the consumption of coal was allied with greater speeds. The Company, always up-to-date, took full advantage of these improvements. As early as 1848, in spite of the prejudice of the Mercantile Marine against the new form of propulsion, the Company had purchased a schooner, the *Esk*, fitted with a screw propeller, and had thus become the first mail company to adopt screw propulsion for the conveyance of mails. A list of past steamers shows that the first vessel made of iron, the *Prince*, of 446 gross tonnage, had been commissioned as early as 1851. Thereafter wood and iron alternated until 1854, when the last of the wooden vessels, the *Tamar*, was ordered. In much the same way paddle and screw fought for supremacy until 1866, after which no further paddle steamers were commissioned. Indeed, the Company again and again renewed its fleet, converting swiftly from wooden paddle steamers to iron, and then to steel screw boats. The simple engines of the earlier vessels gave way to the compound engine, and later to the triple-expansion type, in a continuous effort for greater economy of fuel and higher speeds. Constantly the fleet was changed for ships embodying the latest principles, and it is noteworthy that all these improvements took place without addition to the original capital of the Company.

The Company was increasingly successful in the matter of speed. In 1871, for example, there were launched from the yard of Messrs. John Elder & Co. two splendid screw steamers to its order. These, the *Tagus* and the *Mozelle*, were each of 3,252 tons gross register and 600 nominal horse-power. On her official trip the *Tagus* maintained an average mean speed of 14·878 knots, and her sister ship did even better, with 14·929 knots. At the same time Messrs. Elder made enormous improvements in the iron screw steamer *Tasmanian*, bought by the Company from the European and Australian Steam Navigation Company. On her first voyage after reconditioning from Southampton to St. Thomas, occupying 14 days 2 hours, she consumed only 466 tons of coal, against a former consumption of 1,088 tons on a voyage occupying only 10 hours longer. It is clear from contemporary accounts that these performances were considered out of the common.

#### EXTENDING SERVICES.

With the rapid expansion of South American trade the transfer to smaller vessels at Rio de Janeiro was no longer satisfactory, and in 1869 the Company made Buenos Aires its terminal port. This



extension was inaugurated by the Douro. There were other re-arrangements of the services. The transatlantic steamers extended their voyages to Colón, so avoiding the transfer at St. Thomas. The service to Porto Rico was increased. The West Indian service steamers began to call at Puerto Colombia, and to land the mails at Plymouth, calling thereafter at Cherbourg on the way to Southampton. A mail service with British Honduras was resumed, and in 1872 the West Indies itinerary was reorganised, with Barbados instead of St. Thomas as the transfer point for the islands. In the same year the Ebro left Antwerp and Southampton for Cherbourg, Lisbon, Brazil, and the River Plate, thus establishing for the first time a fortnightly service to South America. A year later was established an additional monthly service to the West Indies, with calls at Bremen and Hamburg. Eight years afterwards this extra service was rearranged on a fortnightly basis.

These were bustling years of expansion and consequent re-organisation, but the mail contracts were not without anxiety. The postal contract was renewed again in 1874, but under grave difficulties. Adverse articles and letters appeared in the public press, and several Members of Parliament insisted on the service being thrown open to public competition. The directors found themselves compelled either to abandon the service altogether or to accept a much lower payment. They adopted the latter course, and undertook the conveyance of the West Indian mails for an annual payment of only £84,750, about a third of the original sum granted. But in addition the Company received £2,000 a year to cover the cost of steamers calling at Plymouth to land the mails, instead of carrying them, as of old, to the port of destination, Southampton. From January 1, 1875, the Brazil mails were carried on an entirely new basis. Payment was made according to the weight of postal matter carried, and the contract was terminable at six months' notice on either side. In 1880 the contract for the West Indian service was further reduced to £80,000, but five years later the Postmaster-General increased it to £90,000. This year saw a considerable increase in the speed of the Company's vessels. The mails between England and Trinidad and Demerara, for example, were conveyed in 14 days. There was a most important extension of the Company's service in 1884, when a passenger and cargo service was established between Brazil and New York.

Let us pause here to consider what manner of ships the public patronised forty years ago. Early in the 'nineties modern ideas of comfort and luxury on board ship were already apparent. In the "Handy Shipping Guide Supplement" for April, 1894, the following description of the Nile and Danube, commissioned by the Company during the previous year for the mail service to Rio de Janeiro and Buenos Aires, is given :—

On the main, upper, and promenade decks, there is accommodation for 215 first-class and 36 second-class passengers, and on the main and lower decks for 554 emigrants. The main dining saloon on the upper deck in each ship, immediately forward of the machinery, is a splendid apartment, being panelled in polished oak, whilst oak panels in bas-relief on gilt ground alternate with the side lights. The music room is situated

immediately over the dining saloon, and is panelled in satin wood and cedar, and has a handsome stained glass skylight in the centre. Aft the music room, but on the other side of the main vestibule, is a ladies' private saloon and a handsome open staircase with heavy carved banisters, communicating with the dining saloon below. The first-class state rooms are unusually large, with every appliance to enhance the comfort of the passengers. Each room is fitted with wire-roped bed and two folding lavatories; whilst each state room has natural light and ventilation. The promenade deck is 140 ft. long amidships, having overhead a shelter deck. This promenade is available in all states of the weather, and at night it can be lit by ten large incandescent electric lights. At the after end of the promenade deck is the first-class smoking room, panelled in walnut, and furnished with circular marble-topped tables and electro-plated fittings.

At the close of the century, when several of the Company's steamers were being used in the South African War as they had been used in the Crimean War, the Company was still essentially a West Indian, Brazilian, and Argentine line, with a fleet of between 80,000 and 90,000 tons of shipping. In 1902, for example, the total mileage was given as 1,265,824, but the Company was on the verge of fresh activities which increased this mileage only six years later to 2,746,425, and the tonnage to 210,000.

The reason for this vast extension is partly to be found in the fact that Sir Owen Philipps joined the Company in 1903. It was then in low water, for no dividend had been paid during the previous year. Within three months of his arrival he was elected chairman, and one of the first things he did was to apply for an additional charter providing that no foreigner should hold office as director. This was granted in 1904. It also contained regulations governing the allotment and transfer of shares, to prevent their going into the hands of foreigners.

After he had been a year in office it was found necessary to build larger and faster and more commodious vessels for the Brazil and River Plate trade, then the mainstay of the Company. New ships needed new money. The Company had already celebrated its Diamond Jubilee, but its credit had sunk so low that when it sought to raise £600,000 by the issue of 5 per cent. non-cumulative preference stock, there was no response from the public and the issue had to be abandoned. The subscribed capital was still £1,500,000 in shares of £100, of which £900,000, or £60 per share, had been paid up. It was decided to call up the balance of £40 in instalments of £5 spread over two years, with the proviso that each £100 fully paid share should be converted into £40 of 5 per cent. preference stock, preferential as to capital and sharing rateably with the ordinary stock in surplus profits.

#### THE "A" STEAMERS.

The Company then ordered the building of the first of the "A" class of steamers, so deservedly popular on the South American routes. It had been found that the wealthy estancieros and coffee planters of South America were as willing to pay for luxury and comfort as were the millionaires of the United States, and nothing was spared to meet their desires. When the Araguaya was delivered from the shipbuilders her sumptuous appointments were a revelation—a

magnificent entrance hall, a dining saloon with a great cupola of stained glass, a social hall with quiet recesses, spacious smoking and card rooms, gymnasiums, endless opportunities for games, a children's saloon, *suites-de-luxe* with private sitting rooms, and single-berth rooms for the more modest traveller. Little wonder that the fashionable world which thronged the Araguaya on her arrival at Southampton was impressed. The Amazon and Araguaya made their maiden voyages in 1906; the Avon followed in 1907, and the Asturias in 1908. Each was built with slightly additional tonnage, until over 12,000 tons were reached. The Arlanza in 1912 was a triple-screw steamer of nearly 15,000 tons.

More than half a century previously the Company had been carrying the Australian mails, and it wished to recapture this service. The P.S.N. Company was allied to the Orient Steam Navigation Company, and a bold bid was made for the vessels owned by the former, with the result that from April 4, 1905, to January 28, 1908, the Australian Commonwealth service was carried on by the Orient-Royal Mail Line, for a payment of £120,000 a year. The contract was made wholly with the Orient Company.

In 1905, for the first time in its history, the Company found itself without the West Indies mail contract, but that did not prove as disconcerting as it might, for the Company decided to carry the mails on the poundage system. One immediate result was an extension of its mail steamer services to New York. The Mother Country was thus linked to the West Indies on the one hand, and to the United States on the other. But the merchants in the scattered Caribbean Sea soon discovered that such a system was not to their benefit, and in August, 1907, the British postal authorities, in conjunction with the Colonial Governments, agreed to a fresh contract, which was for 10 years, and entailed an intercolonial service at a payment of £25,000 per annum. It was followed in January, 1911, by the signing of an agreement for a new fortnightly service between the United Kingdom and the West Indies in return for an annual payment of £63,000, of which £40,000 was payable by the Imperial Government and the remainder by Trinidad, British Guiana, and Barbados. Two twin-screw steamers, the Berbice and the Balantia, were put into commission during 1908-1909 for the intercolonial service.

The year 1908 was eventful. It opened with the acquisition of an interest in the Shire Line of steamers trading to China and Japan. The R.M.S.P. flag might now be seen at the ports of Penang, Singapore, Hong Kong, Shanghai, Nagasaki, Kobe, and Yokohama. In June of the same year the Morocco, Canary Islands and Madeira Line of steamers was acquired, and a regular service from London to Gibraltar, Tangier, Rabat, Larache, Casablanca, Mazagan, Suffi, Mogador, Teneriffe, Las Palmas, and Madeira was then run by the Company. And it was in 1908 that the Company inaugurated its famous pleasure cruises. The first were to the fjords of Norway from Southampton, Grimsby, and Leith.

In 1909 a weekly tourist passenger service was inaugurated between New York and Bermuda. On October 1, 1910, the Company

purchased the entire share capital of the P.S.N. at par, a transaction involving £1,500,000. This was followed by the acquisition of the whole of the Shire Line of steamers. When Sir Alfred Jones died his entire interests were purchased and a new Elder, Dempster Company was formed, with a capital of £910,000. Then followed the purchase of the old-established business of Lamport and Holt, and on April 18, 1912, was purchased the goodwill, fleet, and business of the Union Castle Mail Steamship Company.

#### WAR SERVICES.

The history of the Company's truly magnificent services to the country during the Great War has been told by Mr. H. W. Leslie in "The Royal Mail War Book" (Heinemann, 10s. 6d.). In the month of August, 1914, ten of its vessels, most of them passenger liners, were requisitioned for war service by the Government. Measures had already been taken to protect ships in the possible emergency of war, and ten of the Company's larger vessels had each been armed with a 4.7 in. gun some months before the outbreak.

One of the Company's smaller ships, the Eider, was the last vessel to leave Bremen after war was declared. Another of the smaller cargo vessels, the Teviot, was used for the transport to France of the original British Expeditionary Force, and was later employed for the evacuation of refugees from Ostend under the very nose of the enemy. On August 16, 1914, the Arlanza was halted by a German raider off the Canary Islands, but on reporting that she had 385 women and 97 children on board was allowed to proceed in peace. Early in January, 1915, the Potaro was captured by the raider Kronprinz Wilhelm, and used for a short time as an enemy scout. She was eventually scuttled by her captors. Another of the Company's vessels, the Tamar, was captured by the same raider after an exciting chase. She, too, was scuttled. The Demerara, however, when sighted by a German submarine in the Channel, fought back vigorously with her gun and beat it off.

Those of the Company's liners commissioned as armed merchant cruisers were detailed to the Tenth Cruiser Squadron. They were armed with 6-in. guns, anti-aircraft guns, machine guns, and depth charges, and were partly manned by volunteers drawn from the Company's staff. In the main they were used for the blockade of Germany, but the Alcantara was sent to the Arctic Circle to search for possible submarine bases. In October, 1915, the Arlanza was mined in the White Sea and was for some time blocked in the ice. When repaired she and the Almanzora, the latest of the super-"A" boats off the stocks, were detailed to search the Atlantic for the German raider Moewe. The importance of the Tenth Cruiser Squadron, which contained so many of the Company's vessels, may be gauged from the fact that it kept under guard a stretch of sea 800 miles long, from Orkney to Iceland, and intercepted in all 15,000 ships carrying supplies to enemy countries. When the Tenth Cruiser Squadron was disbanded the Almanzora, Andes,

Arlanza, Ebro, and Avon were used as ocean escorts for convoys, and proved of inestimable value.

Perhaps the most glorious individual exploit of the Squadron was the battle between the *Alcantara* and the German raider *Greif*. On February 29, 1916, the *Alcantara* signalled a vessel, which hauled to and reported herself as the *Rena*, a Norwegian, bound from Santos to Trondjhem. This ship was down on the *Alcantara*'s list for examination. The *Alcantara* had approached to within 1,000 yards of her when the *Greif*, excellently disguised as the *Rena*, dropped hinged ports and uncovered her masked guns. The *Greif* had fired a devastating salvo almost before the deception had been realised. There followed a tremendous exchange of shots at point blank range. The *Alcantara*'s steering gear was wrecked, and at one time the range decreased to 750 yards. When the duplicate steering gear was connected the *Alcantara* increased the range to 12,000 yards, and after 25 minutes of battle the *Greif* caught fire and her magazine exploded. Both vessels sank. The *Alcantara* had lost 68 of her officers and crew; her adversary had lost 118 killed and 118 wounded.

Four of the Company's steamers, the *Aragon*, *Arcadian*, *Cardigan-shire*, and *Asturias*, were employed as transports in the Dardanelles Expedition. They took their places alongside the battle squadron, discharging troops and embarking wounded, often under fire. The *Arcadian*, which was for some time General Hamilton's headquarters ship, was finally torpedoed near Salonika in April, 1917, and sank with the loss of 270 men. Captain Willats, commander of the *Arcadian*, was soon afterwards torpedoed when commanding another of the Company's boats, the *Demerara*, sailing from Liverpool to South America. She was successfully beached at Sablanceaux, near La Pallice, and was subsequently reconditioned. On December 20, 1917, the *Aragon*, with over 2,000 troops on board destined for Allenby's campaign in Palestine, was torpedoed, and sank with great loss of life just outside Alexandria.

No fewer than eight of the Company's steamers were used as hospital ships. The *Asturias* and *Drina* were requisitioned for this purpose on August 1, 1914, and were the first ships to be taken on for hospital duties. The *Balantia* was at the great fire of Salonika in 1917. The *Asturias*, which had landed her wounded at Avonmouth and was proceeding to Southampton with her hospital steaming lights in good order and the Red Cross blazing from her hull, was nevertheless torpedoed. Her stern sank rapidly and she developed a bad list to port, but fortunately was successfully beached on Bolt Head. There was naturally a great outcry about this particular piece of "frightfulness." Two more of the Company's steamers, the *Amazon* and the *Merionethshire*, were torpedoed and sunk before the end of the War. The captain and crew of the *Merionethshire* were adrift in their boats for two days in the Atlantic before they were rescued.

These are but a few of the mishaps and adventures which befell the Company's ships during the War, but enough has been said to show how deeply it was involved in the struggle.

## AFTER THE WAR.

The vessels which had been engaged in the national service were re-delivered by the Government to the Company after the War, and gradually it was able to resume the services disorganised during the previous five years. But the re-delivery of vessels was a slow process and was not finally completed until 1920. Even in 1919 there was a marked revival in passenger and emigrant traffic, but it was some time before traffic and freight to and from South America resumed pre-War proportions. From the War until to-day the history of the Company, as of British shipping in general, is a tale of increasing foreign competition, often under Government subsidy, of high costs and of low freights. But the Company, by maintaining its efficiency and re-organising its services according to the needs of the day, has maintained its prestige with travellers and traders alike. It has been greatly helped in this by its adoption of the motor vessel. The introduction of the *Alcantara* and of her sister ship *Asturias* into the South American trade was a bold venture well repaid by its success. Each has a tonnage of over 22,000. The *Asturias* was delivered in February, 1926, and the *Alcantara* followed a year later. Since their maiden voyages these vessels, incorporating the latest advances in construction and embodying all that is desirable in the way of luxury and convenience for the passenger, have met with the complete approbation of both traveller and trader, for they combine with passenger luxury the most perfect facilities for the transport of valuable perishable cargoes.

The Company has maintained, too, its pre-eminence in pleasure cruising. The cruises to Norway were resumed in 1920. Since then they have been progressively expanded to include the Northern Capitals, the Mediterranean, the West Indies, Bermuda, and trips to the Atlantic Islands and round Africa. To-day the Company's vessels, fitted especially for this particular form of rest and recreation, stand in the forefront of the public's affection.

In 1932 the Company's fleet was transferred to a new operating company, Royal Mail Lines, Limited, with Lord Essendon as chairman and Mr. P. G. Mylne Mitchell as general manager and director. And so, in the 94th year of its incorporation, a new chapter opened in its history.

HOWELL DAVIES.

## CHAPTER XIII.

### THE FRENCH MERCHANT MARINE.

THE French Merchant Fleet is going through a period of unusual difficulty because of the general depression under which all fleets are suffering, and it has also to bear the consequences of French protectionist policy. Agriculture and industry are no doubt of dominant importance in the life of the country, but the protective measures (Customs system and quotas) adopted to favour them cannot but impede sea trade. Further, French shipping suffers from the severe depreciation of currency which occurred just when its Merchant Fleet was being restored after the War, and which still shows itself in the balance sheets of the shipping companies in the shape of excessive capital charges. After a few years of monetary stability and at the time the depression in shipping was beginning to spread, the abandonment by Great Britain of the gold standard unfavourably influenced the rate of exchange, involving a corresponding fall in profits, and the devalorisation of the pound sterling was in no way redressed by the raising by shillings of freight rates, which have practically remained the same. Finally, the social policy of successive French Governments brought them to take such generous and bold steps as the extension to the Merchant Marine of the eight-hour working day and the enforcement of a code of work at sea in the interests of the seamen.

The superposition of these special charges upon other burdens common to all shipowners had in 1932 the result of an almost continuous increase in the amount of French tonnage laid up idle. On September 1 last the tonnage of ships out of commission was 1,092,889 compared with 983,469 tons on July 15, an increase of about 110,000 tons in a few weeks. In spite of a favourable cruising season and many pleasure trips, 29 liners of 252,798 gross tons were idle at the same date. In addition 268 cargo ships of 824,552 gross tons, or 1,100,000 tons dead weight, were laid up at the same date for lack of freights. The severity of the depression is illustrated by the figures for the last four years of the amount of idle tonnage, which from 84,480 tons on July 15, 1929, grew to 169,931 tons at the same date in 1930, to 566,782 tons in 1931 and to 983,469 tons in 1932.

According to the latest statistics available French merchant tonnage amounts to 3,025,517 tons, exclusive of vessels allocated to special services such as fishing. The proportion of laid-up tonnage is therefore over 33 per cent. of the total, whereas for the tonnage of the world in general the proportion is only about 18 per cent.

That the conditions in French shipping are thus noticeably worse than in some other countries can be attributed to the specifically French crisis, the causes of which have just been briefly mentioned ; the necessity of a relatively higher amortisation of material ; the fact that running expenses are higher in France than in most other countries ; the results of French protectionist policy ; and the untoward consequences of successive depreciations in the franc and the pound sterling. The restrictions on exchange and the restraints on maritime trade have caused serious difficulties for French shipping companies. The misfortunes of the *Compagnie Générale Transatlantique* are largely due to an unexpected falling off of its receipts at a time when its need of money was most pressing. Owners of tramp vessels have also been experiencing difficult times, subventions having been lacking since 1918, and in the absence of heavy outward freight, such as coal, they have been the more embarrassed because their fleets, consisting mainly of colliers, are the first to feel the restrictions on imports.

Employment in the merchant marine has been seriously affected, whether by discharges or by contraction of effective staffs with reductions of salaries. Captains and chief engineers approaching the age limit have been pensioned off before their due time, and the emoluments of the shore staffs have been reduced on a progressive scale up to 25 per cent.

#### DEPRESSION IN SHIPBUILDING.

The depression in shipping has directly affected the shipbuilding industry, and the only ships now on the stocks are those intended for companies that are subventioned by the State or are under contract with it. It may be pointed out that these ships run only between France and her oversea possessions or are engaged on the great transoceanic mail services such as those to North and South America.

The total of 3,613,910 gross tons of which the French Merchant Marine consisted on January 1, 1932, may be classified as shown in Table I. The figures show that the liner tonnage constitutes 33 per cent. of the total, and if the proportion of ships subventioned or engaged on contract services had not been so high the condition of French shipping and of her shipbuilding industry would have appeared still more gloomy. Even so, although France ranks fifth among the maritime nations of the world in respect of merchant tonnage owned, she has for several years taken only seventh place in respect of shipbuilding. In 1931 her production of ships (excluding those built of wood) amounted to 103,419 tons. Of the 22 ships five measured over 9,000 tons, including the turbine liners *Champlain* (28,912 tons) and *Colombie* (11,600 tons) and the motor liner *Aramis* (15,500 tons). In the second quarter of 1932 there were 21 vessels under construction in French shipyards, seven of 84,740 tons being steam and fourteen of 43,388 tons motor. Of this total of 128,128 tons the super *Ile de France* accounted for 70,000 tons. It may be noted that no tankers were being built, although



that class of vessel accounted for almost the whole construction in hand in some other countries.

TABLE I.

Description.	No. of Ships.	Gross Tonnage.	
Mail liners { Steam . . . . .	131	899,991	1,195,137
{ Motor . . . . .	8	101,447	
Intermediate steam liners . . . . .	32	193,699	298,262
Passenger and cargo vessels { Steam . . . . .	70	282,851	
{ Motor . . . . .	2	15,411	
Cargo vessels { Steam . . . . .	538	1,518,368	1,532,117
{ Motor . . . . .	13	13,749	
Various (fishing, etc.) . . . . .	—		588,394
		Total 3,613,910	

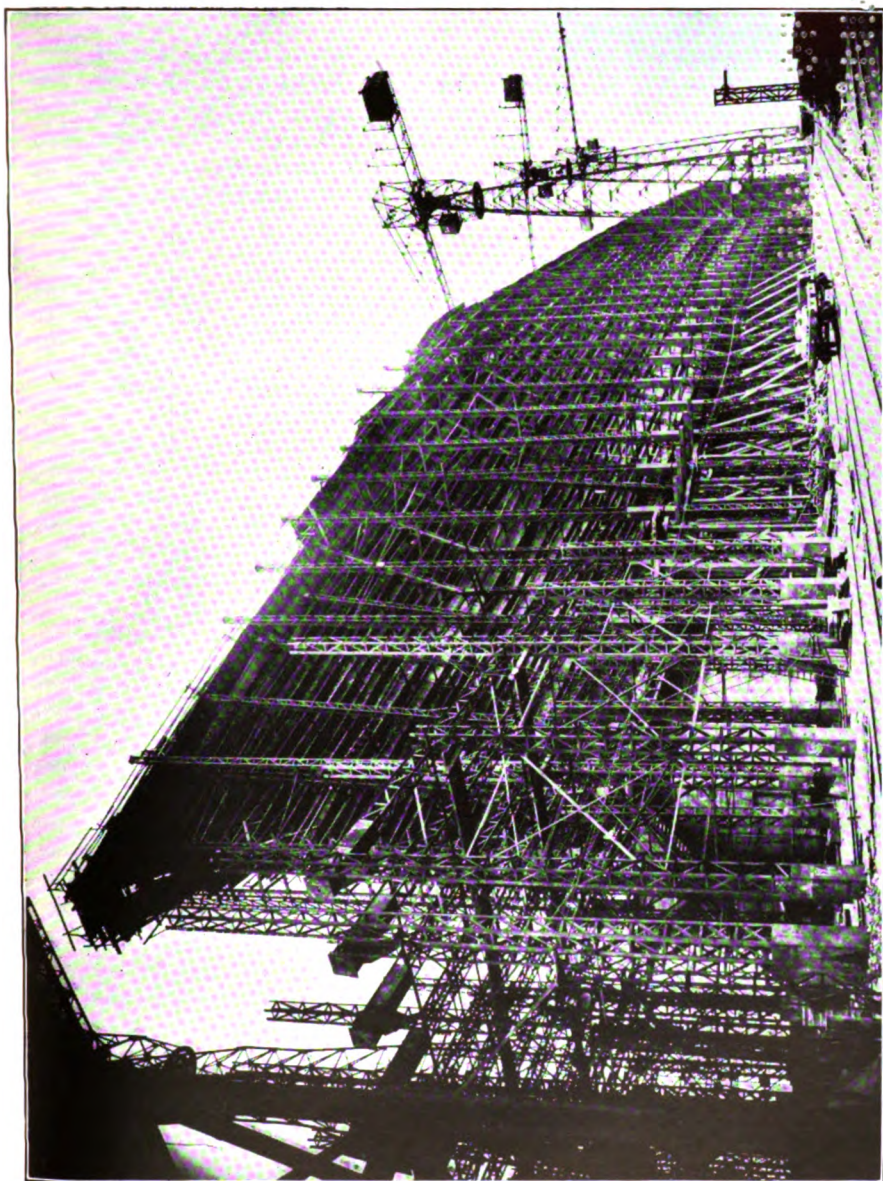
During 1931 the net increase in the total French merchant tonnage was 56,831 tons, as is shown in Table II. The magnitude of the figures of new construction is evidence of the efforts that are being made to renovate the French Merchant Fleet.

TABLE II.

Increases.		Decreases.	
Vessels built in France . . . . .	128,411	Lost at sea . . . . .	20,645
Vessels built abroad . . . . .	35,470	Broken up . . . . .	77,150
Vessels bought abroad . . . . .	27,664	Sold abroad . . . . .	36,919
Total 191,545		Total 134,714	

Difference = 56,831 tons.

The super Ile de France, which was launched as the Normandie in October, it may be recalled, was ordered by the Compagnie Générale Transatlantique at the end of 1930 in order that that company might be able to carry out the obligations imposed on it by its agreement with the State. The vessel, the order for which was placed with the Chantiers et Ateliers de Saint Nazaire-Penhoët, has an overall length of 313 metres, a beam of 36 metres, a displacement of 67,500 tons, a draught of 11·6 metres, and an approximate gross tonnage of 75,000 tons, with a speed of 28 knots. She will be able to carry, in the best conditions of comfort and speed, over 2,000 passengers in three classes. The great cost of the vessel, as well as the special conditions under which she is to be operated, necessitated negotiations between the C.G.T. and the French Government, which, relying on the Convention on the French mail services between Havre and New York, required the construction of a new liner to meet competition on the North American route. In fact, since the French liner Ile de France was put into commission, Germany has built two new vessels each of 50,000 tons and a speed of 27 knots, while a 70,000 ton liner of great speed is on the stocks for the Cunard



CIE. GÉNÉRALE TRANSATLANTIQUE'S LINER NORMANDIE.

ON THE STOCKS, AUGUST 1932.

(Builders, Forges et Chantiers de Saint-Nazaire, Penhoët.)



Company and Italy last year added two liners to her Merchant Fleet, the *Rex* and *Conte di Savoia*, of about 50,000 tons and with a speed of 28 knots on trial, or approximately 26 knots in service. In view of the fact that many of the ships still running on the North Atlantic route are of pre-War construction and will be out of commission in a few years, it was thought that the possession of a fast liner would be of great advantage in the event of a revival of the normal flow of traffic between Europe and the United States, and it was this consideration that, in face of great difficulties, dictated the building of the new ship.

#### SAFETY AT SEA.

As soon as the International Conference of 1929 on Safety of Life at Sea had finished its work, the staffs of the Mercantile Marine Department considered the means of introducing into French Legislation the provisions of the new International Convention. A Bill then drafted for the general revision of the Safety Regulations included the following provisions :

(1) The obligation for each passenger ship to hold a *certificat de sécurité*, issued by the Minister for Merchant Shipping, which is that prescribed by the 1929 Convention and completes the *permis de navigation* which must be held by every vessel sailing under the French flag.

(2) The appointment of a Central Commission sitting at the Ministry of Merchant Shipping and entrusted with the duty of ascertaining that the measures taken in regard to watertight subdivision, life-saving appliances, and protection from fire on board passenger ships are in conformity with the requirements prescribed for the *certificat de sécurité*, the issue of which must be approved by the Commission.

As the Bill ratifying the 1929 Convention passed the Chamber of Deputies on April 22, 1930, and the Senate on December 1, 1931, and the Bill ratifying the 1930 Load Line Convention passed the Chamber of Deputies in June, 1931, and the Senate in December of the same year, France was prepared to put the two International Conventions into operation on the due date.

In the meantime another important Committee has been appointed at the Mercantile Marine Department to frame new rules and regulations for safety at sea. These new regulations will incorporate not only the provisions resulting from the two London Conventions but also other rules embodying recent advances in ship construction. The French Administration has also taken the opportunity of including in a single code rules previously framed for the carriage of dangerous goods and for the control of navigation.

The French Merchant Marine has recently suffered the loss of several important vessels, among them being the *Saint Philibert*, which capsized, and the *Georges Philippart*, which was completely destroyed by fire off Cape Guardafui. The capsizing of the *Saint Philibert* is a warning of the importance of transverse stability in ships, and points the need for strict provisions to that effect in safety

regulations. The burning of the *Georges Philippar*, a vessel in which the precautions taken against fire accorded in spirit and in letter with the provisions of the London Convention of 1929, proved these precautions to be inadequate in view of the extraordinarily rapid spread of the fire.

The protection from fire of ships in port was taken up in 1929 by a technical Committee of the Mercantile Marine Department, and most of its recommendations are now enforced or on the way of being so. But the disaster to the *Georges Philippar* emphasises the necessity of again considering the protection of vessels at sea, special attention being given to the danger that fire may spread almost instantaneously after it has started. It may therefore be that in the new French regulations for safety at sea further provisions for fire protection, deemed necessary since the *Georges Philippar* disaster, will be incorporated to supplement the provisions of the London Convention of 1929. More particularly has the *Georges Philippar* disaster shown that paint and varnish may be the main factors of fire propagation on board ship, and also that fireproof bulkheads—the most important means of limiting the spread of fire—may in certain circumstances have a disastrous effect by impeding the escape of passengers to portions of the ship not attacked by fire. Further, study of the manner in which the flames spread has shown that in view of the existence of great vertical openings in the decks of modern liners (stairs, lifts, etc.), the idea of horizontal propagation (the decks acting as horizontal fireproof bulkheads) must be supplemented by that of vertical propagation.

Thus in France the problem of protection against fire in ships has assumed a wider aspect, and the Minister for the Mercantile Marine has decided on an extended investigation. He has therefore formed a new body, including men of science and the most qualified representatives of the public administration, of shipbuilding and shipping interests, and of other associated industries, and charged them with the task of conducting practical and theoretical researches in order to devise suitable tests for the paints and varnishes used in ships. This body is also to make experiments on the fireproofing of wood, fabrics, and other inflammable material found on board ship. These researches and experiments are now in progress.

#### THE FUTURE.

Various measures have been suggested in France, as in other countries, for promoting the recovery of shipping, such as the limitation of new construction. France also is quite willing to take part in international arrangements for rationalising the traffic on the important maritime routes. This matter in fact has already been discussed by the Franco-German Committee of the Merchant Marine, which met during 1931 in Paris and in Berlin. The Committee suggested that the shipping companies of different countries engaged on the same routes should come to some arrangement with regard to sailing schedules, and a letter to this effect was addressed to each of the International Shipping Conferences for circulation to the

companies concerned. It is thought also that these companies may eventually be able to agree on measures for limiting the number, tonnage, and speed of new ships. The opinion is further held that the rapid ageing of the tonnage laid up will tend to re-establish the balance between the carrying capacity of the world's fleets and the normal needs of international traffic.

Shipping, by its very nature, cannot enjoy the advantages which a policy of Customs protection can assure to industries that are fixed to the soil and work within a closed ring. That is why States are sometimes obliged to come to the aid of their shipping in various ways. France, for example, granted navigation bounties and *compensations d'armement* under laws passed successively in 1881, 1893, 1902, and 1906. As far as shipbuilding is concerned the methods adopted have always been designed to maintain the activities of the country's shipyards, in which costs of production are higher than in those abroad, without depriving French shipowners, obliged to face world competition, of liberty to place orders for ships where they would.

Since 1918 there has been, in France, no State aid for merchant shipping except for the tanker fleet, the tonnage of which had to be increased to meet national needs. It appeared necessary to induce owners to add to the number of tankers flying the French flag, and accordingly since 1925 bounties proportionate to the amount of imports from abroad into French ports have been granted to tanker owners. Before the War this tanker fleet was practically non-existent (only 4,000 tons), and its present size (225,450 tons, nearly all ocean-going) is far from commensurate with France's requirements of oil products, about 3,500,000 tons annually.

For the operation of sea mail services of an international character the French Government has entered into agreements with the Compagnie Générale Transatlantique, the Messageries Maritimes, and the Compagnie de Navigation Sud Atlantique, and in its latest postal conventions it has endeavoured to minimise its risks by instituting a fixed annual bounty per contract and establishing sinking and renewal funds for the renovation of the fleets.

After the stabilisation of the currency in 1927 and the adjustment of prices in accordance with the new value of the franc, new difficulties quickly beset the shipping industries. Opinion, both in Parliament and among the general public, being opposed to a return to the system of bounties and *compensations d'armement*, other means had to be sought for the assistance of shipping and shipbuilding. The question was examined by an Extra-parliamentary Committee of the Mercantile Marine Department, and as a result laws were enacted on August 1, 1928, instituting a system of advances on mortgage to promote the building and purchase of ships, and on August 10, 1929, granting certain fiscal exemptions to diminish the burdens falling upon the French shipbuilding and repairing industries.

JEAN MARIE,  
Ingénieur en Chef du Génie Maritime.

## CHAPTER XIV.

### THE PORT OF HULL.

THE name Hull has been generally accepted from very early times, but the correct name, as given to the port by Edward I some short time after he had acquired a large holding in the vicinity, was King's Town-upon-Hull, which to-day is abbreviated to Kingston-upon-Hull. The port ranks third in importance in the United Kingdom. As its name indicates, it stands on the River Hull, lying at the junction of that river with the Humber. It is situated 20 miles from the mouth of the estuary, at a most convenient point for shipping. The Humber, which itself receives the waters of the Trent, Ouse, Don, Derwent, Aire, and other streams, forms, with its present-day canals, the biggest navigable waterway in Great Britain.

Hull is frequently referred to as England's eastern gateway because of the large area it serves, which can be more economically reached through it than through its rivals of London and Liverpool. This area possesses excellent transit facilities by rail, road and water. It embraces such large centres as Derby, Birmingham, and the West Riding of Yorkshire, and it stretches as far north as Berwick. Traffic is also regularly exchanged with large centres lying immediately outside this area, such as London, Cardiff, Manchester, Liverpool, Glasgow and Edinburgh. The population of Hull, estimated in Frost's "Early History of Hull," to have been approximately 2,000 in 1337, had risen to something over 300,000 in 1931, according to the latest local return.

The site occupied by the port and docks was once marshland, probably submerged at high tides, which at some period not exactly known was reclaimed by embankments thrown up by the people settled on the higher ground at such places as Hessle, Kirkella, Cottingham, and Sutton a few miles from the town, the waters of the Humber being thereby confined to a very much narrower channel and large areas of valuable agricultural land brought into being. It would also appear that the River Hull formed a delta at its confluence with the Humber, as history records the existence of a second stream which reached the Humber half a mile or so to the westward of the present mouth of the existing river. It may, therefore, be assumed that the old town and port of Hull originated from settlements on the banks of these two rivers, and was originally situated on an island which ultimately disappeared when the adjoining land was more completely drained into the present River Hull. Documents dating from the thirteenth century name the

river to the west of the present River Hull as Ald Hull or Old Hull.

Foreign settlements were dotted all along the Yorkshire coast, and one known as Ravenser, which was close to the mouth of the Humber, was originally a port of even greater importance than Hull. Long ago it disappeared beneath the waters of the North Sea, possibly through alteration in the course of the Humber and the encroachment of the sea. As the name indicates, Ravenser was of Danish origin. It was a thriving seaport in the reign of Edward I, as it obtained a charter at the same time as Kingston-upon-Hull obtained her first charter from this monarch. In 1361 it was overwhelmed by floods, although a short time previously the principal merchants had withdrawn into Hull.

In Domesday Book, compiled in 1085, the name Hull does not appear, but such names as Myton, Southcoates, Drypool, and Marfleet are mentioned—areas which have for many years been well within the city boundaries. It would also seem that part of the area which after the Norman Conquest became the original port of Hull consisted of a number of sheep farms which in the time of King Alfred had been placed in the Hundreds of Hessle and Ferriby. Two of these areas were known as Wyke and Hull, and it appears that the district of Wyke was given by William I to Ralph Mortimer at the same time as the district of Hull was given to Count Mortain. The latter district escheated to the Crown in 1293, and thus Edward I obtained a holding in the immediate area of the present port.

In 1150 the Abbey of Meaux was founded by William le Gros, and he bought what was then the settlement of Wyke with adjacent land. The monks were evidently keen men of business who realised the advantages of creating and extending a port on their own property, and for many years there was great rivalry between them and the Archbishop of York, *versus* other vested interests, the principal of which was represented by Saer of Sutton. The latter, at some date between 1242 and 1255, placed himself outside the pale of the law and sought the protection of the Archbishop of York, to whom he gave up his claims over the water of the River Hull. In 1278 the Abbot of Meaux petitioned "for a market on each Thursday at Wyke near Myton upon the Hulle and for an annual faire of twelve days' duration," and in 1299 Edward I, who had acquired the possessions of the monks in Wyke, granted two markets each week and extended the annual fair to thirty days.

When Wyke became royal property it was put under a warden, Richard Oysel, who also held the Seignury of Holderness. He appears to have been a very able and long-sighted man, and he promptly obtained authority to spend money on effecting improvements. In 1299, on the petition of the inhabitants, a charter was granted to Hull by Edward I, who in the following year visited the town and personally supervised the arrangements for further improvements, such as roads leading to Hessle, Beverley, and *via* Sutton to Bilton.

As the town was growing in importance, and trade was expanding, the inhabitants again petitioned the King, this time that the port



should be enclosed to protect it from pirates and raiders. In 1322 the fortifications were begun. They consisted of a wall round the town with castellated gates and deep, wide ditches. The walls extended for some 2,610 yards in circuit, and the moat followed the line of the present Queen's Dock, Prince's Dock, and Humber Dock.

In the fourteenth century the present River Hull was referred to as Sayer Creek, and the port, consisting of the old harbour southwards from Sculcoates Gate to midstream of the Humber, was granted to the Corporation with power to levy dues on goods and tonnage on vessels. At this time the principal trading houses of the town stood along the western bank of the river, and the residences of the principal merchants abutted on what was then known as Hull Street, running parallel to the river; to-day this thoroughfare is called High Street. These residences had gardens behind them stretching down to the river, and there were warehouses at the extremities of these gardens, bordering the river's edge, where vessels could be discharged and loaded from adjoining staiths. Wooden cranes were also utilised for discharging and loading vessels. The early trade of the port consisted of the export of wool, wool fells, leather, and lead from the Peak district. These were known as staple commodities, and although York was the staple town, Hull ultimately became the staple port of shipment from which these goods might be exported, and where they were re-weighed for Customs purposes. The import of wine was also a traffic of considerable importance.

Henry IV, in the first year of his reign, renewed the town's charters, although it had supported Richard II against him and had refused to hand over the town when, as Duke of Lancaster, he had effected a landing near Ravenspur and marched on the town.

In 1448 Henry VI visited Hull and created Kingston-upon-Hull, together with its precincts, a county with a sheriff, and Hullshire, or the County of Hull, extended for some nine miles in length with an average breadth of two miles. This ordinance remained in force until Hull became a County Borough under the Local Government Act of 1888. This king, during his reign, granted the town no fewer than six charters.

The military and naval importance of Hull, as well as its valuable trade, was recognised by practically every monarch in turn as they came to the throne. In 1540 Henry VIII ordered a considerable extension of the fortifications, which had been previously augmented in the reign of Richard II, and caused to be erected on the eastern side of the River Hull three strong fortified block-houses, the centre one being known as the Castle. In 1681 the wall connecting the north block-house to the Castle was removed, and a fort known as the Citadel was built at a cost of some £100,000. The fortifications were laid on immense piles, the work not being completed until 1700.

From time to time the port had been required to furnish ships and men for the various monarchs in defence of the country. In

the reign of Edward III Hull furnished 16 ships and 488 men, at a time when London was called upon to furnish 25 ships and 662 men. The town fitted out two ships and raised a body of soldiers in the reign of Richard II.

When Charles I came to the throne and the country was menaced by war with France, Hull was required to provide three ships. The town also paid tonnage and poundage to the King without complaint although many other ports resisted. When Charles saw that trouble was coming to a head he accumulated vast stores in the Castle and visited the town, being entertained in Wilberforce House. A little later, however, when Civil War became imminent, and he sent the Earl of Newcastle to take possession of the town and Castle in his name, the town refused to surrender first to the Earl and then to the King, who appeared at the gates in person. This was the first open act of hostility between Parliament and the King. Hull withstood a long siege as the Royalists erected forts at Paull on the east, and at Hessle Cliff on the west side, dominating the approach by water, as well as a third fort at Sculcoates.

During the Middle Ages one of the principal revenues of the Crown was derived from the export tax on wool and wool fells and leather. These commodities were exported mainly to the Low Countries, and smuggling took place with the object of avoiding payment of the tax. In spite of this smuggling, both during Queen Elizabeth's reign, in 1559, and during the reign of Charles II, in 1674, Hull secured exemption from the Acts which were passed establishing legal quays. During the reign of George II, in 1746, the Commissioners for Customs pointed out that smuggling had become rampant in Hull, and that although previously the shipping had been confined to the west bank of the river and the town, which was completely surrounded by fortifications, goods were being carried beyond the walls and outside their jurisdiction. The Hull Corporation and Trinity House, supported by the Hull merchants, again resisted for a time the imposition of a legal quay, but the threat of the Customs to form a legal quay at another port in the Humber had the necessary effect, and it was eventually decided to build a legal quay in Hull as otherwise trade might be diverted elsewhere. Consequently, in 1773, it was decided to form a company to build a dock, the capital being fixed at £80,000.

The first Dock Act of 1774 charged this company with the completion of a dock within seven years. The Government handed over for the purpose the lands, buildings, and moats constituting the fortifications of the town, which ran in a half-circle from the upper part of the old harbour on the east round the north to the River Humber. The Commissioners of Customs contributed £15,000, in return for which they were empowered to collect Customs on the dock frontage known as the Legal Quay. The dock company were authorised to collect tonnage dues on shipping using the old harbour, the company also being bound to make and maintain certain roadways which involved the purchase of additional land. The construction of the dock, which was called "The Dock," and was one of the earliest to be built in the United Kingdom, was begun in

October, 1775, and was completed within three years, the first ship to enter being the Greenland whaler *Manchester*, on October 22, 1778. The capital cost was not as great as was anticipated, and only 102 shares of £250 each were taken up. Of these the Corporation took 10, Trinity House 10, and the Charterhouse one, while private citizens and a number of outsiders took up the remainder. Before the opening of "The Dock," the annual tonnage of the port had amounted to 100,000 tons, but with the development of the port by the construction of many docks which followed in successive years, the shipping rapidly increased. Passenger services were opened with both the Continent and the New World, and it is interesting to note that an adult fare to Quebec cost £5 and that of a child £1 10s. Sales of imported negroes were regularly held in the auction marts in these early days.

The next dock to be constructed was Humber Dock at a cost of £233,000. This dock opens directly on to the Humber and was completed in 1809. The Corporation and Trinity House together provided half the capital cost, in consideration of which the Crown granted the Corporation 29 acres of land on the east side of the River Hull, extending from the north blockhouse to the citadel, and including the foreshore of the river estuary.

Twenty years later, Junction Dock, now known as Prince's Dock, was constructed and joined Humber Dock to "The Dock," so that an alternative waterway was formed joining the River Hull with the Humber.

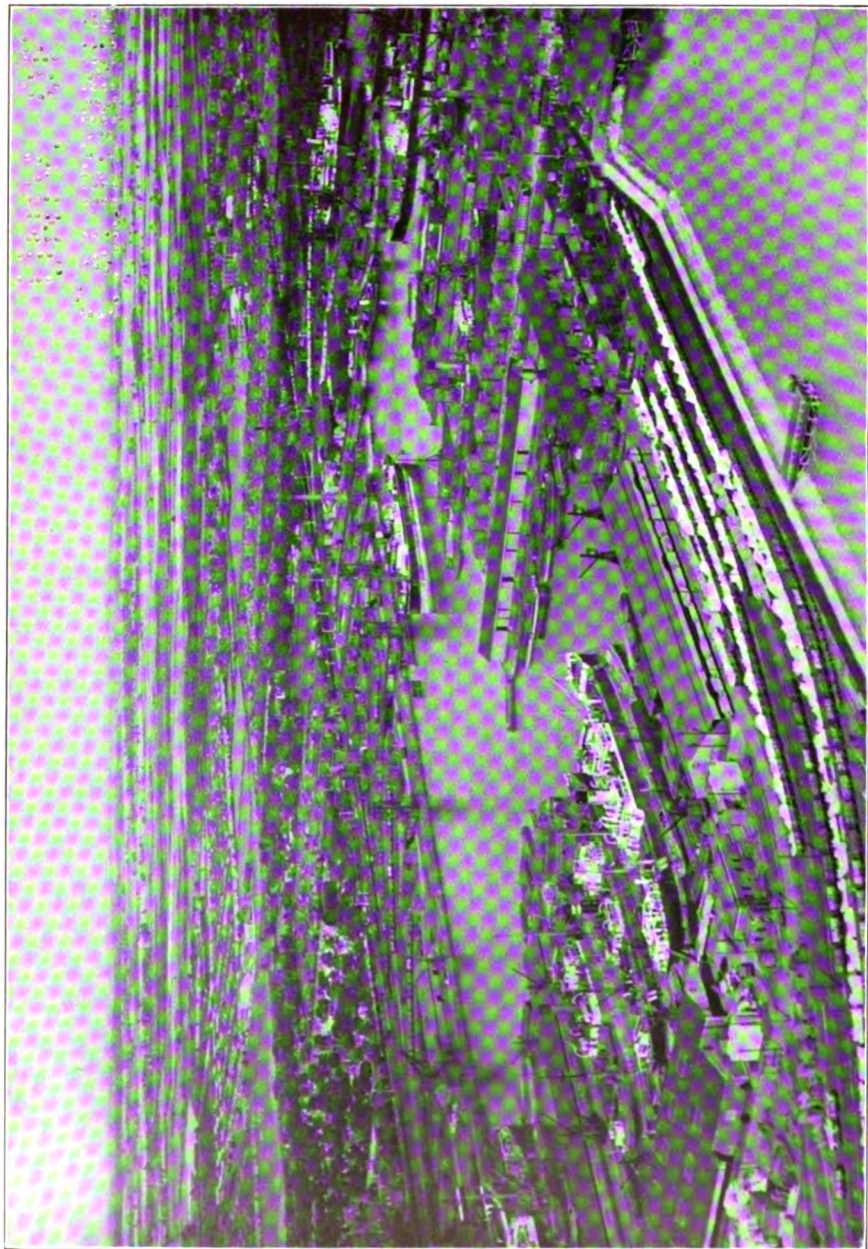
Railway Dock was added to Humber Dock in 1846, and in 1850 the Victoria Dock and Drypool Basin were constructed on land which had previously formed part of the Old Citadel site. This dock possesses a timber pond. In 1854 Queen Victoria and Prince Albert paid a visit to Hull and sailed through the first three docks. In honour of the occasion the name of Junction Dock was altered to Prince's Dock, and the name "The Dock" was changed to Queen's Dock. The Dock Company had built fine offices adjoining the Queen's Dock which to-day are still known as the Dock Offices, Queen's Dock was purchased by Hull Corporation in 1931 and is now being filled in.

Special reference must be made to the whaling industry of which Hull was an important centre. Whereas in 1784, five years after the opening of "The Dock," nine ships had been sent from the port and returned with 395 tons of oil to the value of £15,635, in 1818 no fewer than 63 ships were sent, returning with 6,226 tons of oil, representing a value of £248,430. After 1834 the industry fell off enormously as the whales had been hunted almost to extinction, and gradually it was replaced by vegetable oil milling from the crushing of imported seeds and nuts. Hull to-day is the largest importing and seed crushing centre in the world.

As the size of ships and shipping increased, the existing docks proved inadequate, and in 1861 the excavations for the Albert Dock were begun, the dock being opened by King Edward VII, when Prince of Wales, in 1869. The dock cost over £1,200,000.

The construction of these docks was followed in 1880 by an

1898



ALEXANDRA DOCK, L.N.E.R., HULL.

extension to the Albert Dock, called the William Wright Dock which includes a graving dock for the dry-docking of vessels. The construction in 1883 of the St. Andrew's Dock for the localisation of the fishing industry was followed by an extension to this dock which was completed in 1887. The extension is fitted with four slipways for the repair of trawlers. The capital outlay for these docks in their original state exceeded £4,000,000.

In 1879 a company was formed to construct a new railway and dock giving direct access to the West Riding of Yorkshire independent of the North Eastern Railway. It was styled the Hull, Barnsley, and West Riding Junction Railway and Alexandra Dock Company, and the Corporation of Hull, which in 1880 obtained powers to assist it, subscribed £100,000 out of a total capital of £3,000,000. The first sod of the Alexandra Dock was cut in 1881, and the dock was completed in four years. It possesses two graving docks, and an extension was added in 1899.

In 1892 a joint Bill was promoted by the North Eastern Railway and the old dock company for the transfer of the dock properties to the railway company, together with certain liabilities in exchange for certain stocks, the railway paying annual dues to the Hull Corporation. Following this transfer the Riverside Quay, at which steamers can berth at all states of the tide, was built by the railway company along the river front for a distance of 2,500 ft., and was provided with electric cranes together with a passenger station and other conveniences.

In 1910 the Hull and Barnsley Railway Company built the River Pier outside the Alexandra Dock, and equipped it with two coaling conveyors, shed accommodation, and electric cranes.

In June, 1914, the King George Dock was opened by King George V. This dock, with a water area of 53 acres, was the joint property of the North Eastern and the Hull and Barnsley Railway Companies, and is to-day the most up-to-date dock on the east coast of England. It includes two large graving docks, ample shed and storage accommodation for goods, two coal conveyors and two coal hoists. The quays are provided with electric cranes, and the dock possesses a grain silo with a capacity of 40,000 tons, into which ships can discharge by means of elevators and conveyor bands running under the quays. Bulk cargoes of grain, seed, palm kernels, and soya beans can also be discharged to craft by means of portable elevators and conveyors with overside floating automatic pontoon weighers. A large wool shed has been provided, and storing and unstoring is effected by means of electric winches. It is interesting to recall that the King George Dock was converted into barracks immediately on the outbreak of the War, and the two battalions raised by the North Eastern Railway from their staff, the 17th and 32nd Northumberland Fusiliers Pioneers, received their early training there.

To-day the London and North Eastern Railway Company are the sole proprietors of the Hull docks, which cover a total water area of 210 acres, with approximately 600 acres of open storage space, the major portion of which is utilised by the timber trade.

The docks, of which particulars are given in Table I, extend along a river frontage of some seven miles, and possess 12 miles of quays. At Salt End, at the eastern extremity, there are two deep-water

TABLE I.—DOCK ACCOMMODATION AND EQUIPMENT.

Dock.	Water Area.	Entrance Width.	Lock Length.	Depth H.W.O.S.T.	Coaling Appliances.	Cranes (including Coaling Cranes).	Warehouses.	Cold Storage.	Open Storage.
King George Dock .	acres 53	feet 85	feet 750	feet 39½	2 Conveyors and 2 hoists	56	6	—	acres 200
Alexandra . . . .	46½	85	550	34	7 hoists	65	12	270,000	210
„ (extension)	7½	70	—	—	and 2 cranes	66	13	520,000	
Albert and William Wright.	30	80	320	29	3 hoists and 6 cranes.	—	—	—	
Victoria . . . . .	25½	50	—	26½	2 conveyors	11	11	—	
„ Timber Pond	10	—	—	—	1 crane	—	—	—	
St. Andrew's Fish Dock and Extension.	19½	50	250	29½	5 cranes	6	—	—	130
Humber . . . . .	9	42½	158	26½	1 hoist	3	2	—	
Railway . . . . .	3	42½	93	27½	1 crane	6	5	—	
Prince's . . . . .	6	36½	130	21	2 cranes	10	2	—	

## RIVER QUAYS AND JETTIES.

	Length.	Depth L.W.O.S.T.	Coaling Appliances.	Cranes.	Warehouses.
Riverside Quay . . . .	feet 2,500	feet 18	—	13	Covered throughout
River Pier (Alexandra Dock) . . . . .	1,350	18	2 conveyors	3	1
Salt End Oil Jetties . .	—	30	(Vessels discharge direct to tanks through pipelines)		

jetties which are equipped with pipe lines for the importation of oil in bulk as well as of bulk molasses. A minimum depth of 30 ft. of water L.W.O.S.T. is maintained, and enables the largest tankers afloat to berth safely. On the Salt End Estate, which consists of some 1,000 acres, there are large oil tank installations owned by the Shell-Mex and British Petroleum Company, the Anglo-American Oil Company, and others. Other large works in the area are owned by British Industrial Solvents, Limited, and the Hull Distillery Company. These firms manufacture acetone, industrial alcohol, and allied chemicals.

The port possesses a floating crane of 80 tons capacity, and there are in the various docks many cranes of high capacity, the

largest being one of 100 tons in the Alexandra Dock. Particulars of the dry-dock accommodation are given in Table II.

Hull's industries are numerous. As has already been mentioned, Hull is the largest seed-crushing centre in the world. The oil seed

TABLE II.—DRY-DOCK ACCOMMODATION.

Name of Dock.	Extreme length at floor level.	Width at entrance.	Extreme length.	Length of cradle.	Depth at H.W.O.S.T.		Owners.
					On sill.	On blocks.	
	ft.	ft.	ft.	ft.	ft. ins.	ft. ins.	
King George Dock—							
No. 2 . . . . .	562½	72	—	—	28 4	28 2	L. & N.E.R.
No. 1 . . . . .	460½	66	—	—	28 4	28 1	L. & N.E.R.
Alexandra Dock—							
No. 2 . . . . .	567	61	—	—	21 6	20 3	L. & N.E.R.
No. 1 . . . . .	516	56½	—	—	19 0	17 9	L. & N.E.R.
Dry Dock No. 1 (Albert & William Wright Dock).	492½	50	—	—	22 3	22 0	L. & N.E.R.
Provided with two side berths.	150	—	—	—	22 3	22 6	
Central . . . . .	345	51	—	—	18 0	—	Hull Central & Dry Dock Engineering Co.
Union . . . . .	216	48½	—	—	14 0	—	Union Dry Dock & Engineering Co.
No. 1 Dry Dock, High Street.	150½	37	—	—	13 0	—	Drypool Engineer- ing & Dry Dock Co.
North Bridge Dry Dock.	169	33	—	—	15 0	—	Brigham & Cowan (Hull), Ltd.
Lime Street Dry Dock.	120	38½	—	—	13 0	—	Yorkshire Dry Dock Co.
Lime Street Float- ing Dock.	78	23	—	—	—	10 6	Yorkshire Dry Dock Co.
Crown Dry Dock (Garrison Side).	131	25	—	—	14 0	—	Yorkshire Dry Dock Co.
Bankside Floating Dock.	82	24½	—	—	—	7 0	Yorkshire Dry Dock Co.
Brown's Dry Dock	163½	36½	—	—	11 0	—	Brown's Shipbuild- ing & Dry Dock Co.
*Patent Slipway A, St. Andrew's Dock Side slipping berth.	—	—	620 150	140	—	25 8	L. & N.E.R.
Patent Slipways B & C, St. Andrew's Dock.	—	—	522	140	—	19 8	L. & N.E.R.
Patent Slipway D, St. Andrew's Dock.	—	—	585	140	—	23 8	L. & N.E.R.
Patent Slip, Victoria Dock Basin.	—	—	660	260	—	17 0	L. & N.E.R.

\* Under construction.

trade doubtless originated between Hull and Russia. At first the oil was obtained by means of a stamper press worked by hand, which squeezed out the oil by a process resembling pile driving.

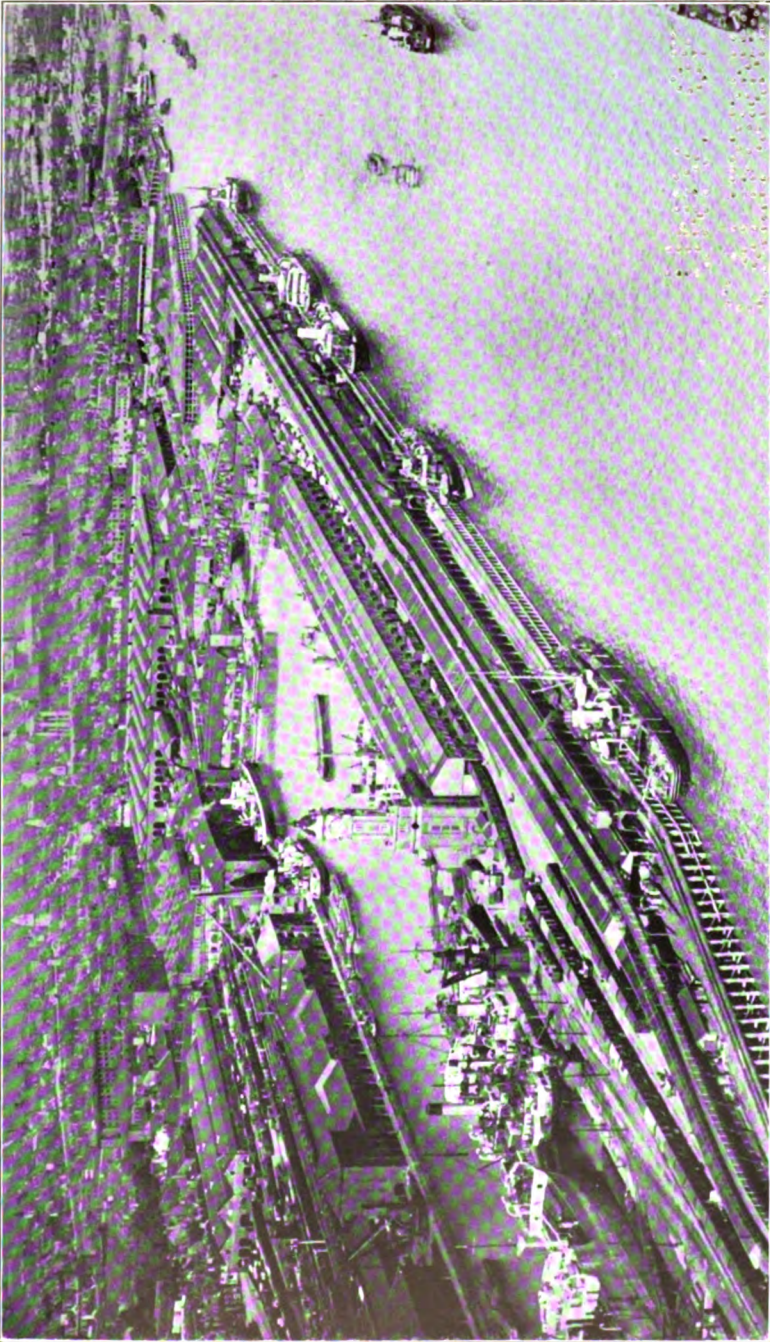


Great pile-like logs were held in position perpendicularly and fitted with a square iron shoe, beneath which was a quantity of seed in a V-shaped oak receptacle with a large oak wedge in the middle. As the stamper fell it hammered the wedge against the side of the receptacle, crushing the linseed in the process, and by this primitive means the oil was extracted. The making of cake for cattle feeding purposes is one of the uses to which the otherwise waste product was put. A hundred years ago a stamper press with one man made nine cakes an hour; to-day a good hydraulic press makes 100 cakes in the same time.

Various seeds are imported for the use of this trade. They may be classified into those rich in oil and those which contain less than 50 per cent. of oil. Among the former are ground nuts, sesami or gingeli, castor, rape seed, mowrah, copra, and palm kernels. Examples of those less rich in oils are linseed, cotton seed, niger seed, hemp, poppy, and soya beans. By far the greater proportion of these seeds is cultivated within the British Empire. Apart from manufactured oil, large quantities are used in the manufacture of soap, paint, linoleum, varnish, and lubricating oil, and oil is also used for baking and frying and for making margarine. There are a large number of mills in and around Hull, and the imported traffic to them is practically entirely water borne, the ships discharging overside to lighters which proceed direct to the respective works.

To-day Hull is the greatest fishing port in the country. This trade is located at St. Andrew's Dock and St. Andrew's Dock Extension, which are provided with every modern facility and convenience. Hull was the first port on the east coast at which the deep-sea trawlers from Brixham settled about 1854-1855, although fishing had been carried on in a smaller way at an earlier date by Brixham fishing smacks and other sailing vessels. By 1869, 270 fishing vessels sailed to the North Sea fishing ground. The opening of the Albert Dock, with the additional facilities which were provided, gave a stimulus to the fishing industry. By 1873, 330 vessels were sailing regularly from Hull.

The fishing was still confined to around the Silver Pits and the southern end of the Dogger Bank. As larger and better trawlers were built, however, they gradually extended their operations farther afield. Steam was introduced in the trade in 1884, and by the end of last century no fewer than 200 large steamers were operating from the port, the sailing smack having completely disappeared. The otter trawl, which appears to have been introduced about 1895, accounted for greatly increased catches. At this time the catching power of one steam trawler was equal to that of 8 or 10 smacks. Fishing by the end of the nineteenth century had extended to the Faroe Islands and the Iceland Banks. By 1907 the White Sea Banks had been added to the fishing grounds, though in 1927 the use of these grounds had to be discontinued as the Government were no longer able to guarantee protection for British vessels in that area. A partial resumption has, however, since taken place. Fishing for halibut in the Davis Straits is another Hull venture which has proved very successful. Two large refrigerated vessels



RIVERSIDE QUAY, L.N.E.R., HULL.

1. *Pharmaceuticals* (1998) 10, 11.

have been equipped for this fishing, and these, when they return to port, keep the halibut in cold storage, supplying it daily to the market as required. Fishing during the last few years has extended farther afield, and trawlers now regularly fish in the vicinity of Bear Island. A recent development has been the filleting of fish immediately after it has been landed, the offal being taken to the Hull Fish Meal Factory at St. Andrew's Dock. The fact that fish is sent by rail to no fewer than 4,000 different stations every week gives an idea of the vast organisation required to cope efficiently with its distribution.

Flour milling is a very important local industry. The greater proportion of the grain imported to the port is discharged by means of the mechanical plant installed by the railway company in the King George Dock.

Hull is one of the largest and oldest centres in the world for the manufacture of paints, enamels, stains, varnishes, distempers, ship's compositions, etc. Some 20 firms are engaged in this extensive industry, which provides employment for many hundreds of workmen.

The first steam packet constructed in England was built on the River Hull in a yard off Wincolmlee in 1796 by two local inhabitants who were subsequently granted a patent. The vessel was bought by the Prince Regent, who granted each of the inventors a pension of £70 a year for life. There are several large ship-repairing firms in the port, and of recent years a large number of steam trawlers and tugs have been built in the district.

Aircraft construction is carried on in the near vicinity of Hull by the Blackburn Aeroplane and Motor Company, which specialise in flying boats and other types of aircraft suitable for military purposes and coastal defence work, and in aircraft of a commercial type.

Hull is noted for the manufacture of cement. This industry was started in 1809 by two brothers who began as marble merchants and manufacturers of Roman cement. In 1824 Portland cement was manufactured, and since that date the business has steadily forged ahead, until to-day the firms engaged in it deliver thousands of tons a week.

The famous firm of Reckitt & Sons, Limited, who manufacture starch, blue, and many other commodities, was founded in Hull as far back as 1840. To-day they have factories and branches in all parts of the world, and many thousands of the population find regular employment in their works in Hull.

The manufacture of sweets and confectionery now takes a prominent part in the industrial activities of Hull.

Coal is one of the principal exports, and immediately before the War and since the War has in some years amounted to about 7,000,000 tons. Much of it is required for bunkering purposes, over 500,000 tons annually being used for the bunkering of the fishing fleet alone. The coaling appliances are now undergoing extensive renewals, and the shipment of coal from 20 ton wagons will shortly be possible at all the docks. Hull is the natural exporting centre for the coalfields of Yorkshire, Nottinghamshire, and Derbyshire, and it is a natural corollary that the port should also be a large importer of pitwood.

In connection with the import of sawn timber and pit props, in which Hull ranks second in importance in the United Kingdom, saw-milling, as a natural sequence, has assumed large dimensions.

The import of wool for the West Riding district has increased to a very considerable tonnage, and here again Hull is seen to be a natural importing centre for the closely adjacent wool textile manufacturing district of the West Riding of Yorkshire.

The import of fruit and perishables has in recent years assumed considerable dimensions, and the markets of Hull are attended by buyers not only from most of the important centres in the Midlands, but also from the Continent. The value of Hull's import and export trade over a series of years is shown in Table III.

TABLE III.—VALUE OF TRADE OF HULL.

Year.	Imports.	Exports.
	£	£
1913. . . . .	49,840,283	34,765,134
1914. . . . .	41,027,070	26,812,600
1915. . . . .	50,157,191	22,966,471
1916. . . . .	54,155,257	32,611,077
1917. . . . .	57,121,843	26,538,918
1918. . . . .	75,702,128	14,696,594
1919. . . . .	85,153,417	62,869,698
1920. . . . .	95,576,751	77,375,168
1921. . . . .	60,459,205	31,463,630
1922. . . . .	63,220,761	38,123,330
1923. . . . .	65,277,861	36,758,584
1924. . . . .	80,938,559	40,247,748
1925. . . . .	75,255,416	39,827,751
1926. . . . .	75,552,748	29,904,473
1927. . . . .	72,944,758	35,538,570
1928. . . . .	72,445,249	35,904,115
1929. . . . .	74,996,352	34,277,855
1930. . . . .	61,298,853	27,669,961

This article would not be complete without some reference to the shipowners who have assisted so materially in building up the trade of the port. As far back as the middle of the fourteenth century a record exists giving the number of local shipowners as seventeen, and it would appear that these owners traded principally with Northern and Central Europe. To-day Hull is in direct communication with all parts of the world. Messrs. Thomas Wilson, Sons and Co., founded by a local resident, Mr. Thomas Wilson, in 1825, became the largest and most important shipowners in Hull. The undertaking developed through succeeding years until shortly before the War it was the largest privately owned shipping line in the world. The founder was the father of the first Lord Nunburnholme, whose descendants in their successive generations have taken such a prominent part in the building up of Hull and its commerce. The line still retains its independent organisation, although it has been acquired by Sir John Ellerman, and its name altered to Ellerman's Wilson Line.

H. S. COLE,  
Docks Superintendent, Eastern Area, L.N.E.R.

## CHAPTER XV.

### MERCANTILE MARINE MACHINERY.

AN adequate summary of last year's work in mercantile marine machinery could, so far as actual production is concerned, be given in a few short paragraphs, as the black clouds which have so long hung over the shipping, shipbuilding, and cognate industries showed no signs whatever of lifting. The crisis in the autumn of 1931, the supplementary taxation imposed, the departure from the gold standard, and the general unrest engendered by the knowledge that the country's financial and political position was in a condition of neutral, if not unstable, equilibrium, all combined to strangle what little chance there was of revival.

The past year saw stability re-established politically, and the success of the War Loan Conversion and the Ottawa Conference raised hopes that the large amount of suspended work would shortly be restarted and a revival brought about by the greater demand for the carriage of commodities. At the close of the year, however, the depression had not appreciably lightened, and while the placing of Admiralty contracts afforded a modicum of relief to those shipbuilders and engineers who undertake this type of work, the prospects for liner and tramp machinery did not appear to be materially brighter. The amount of laid-up tonnage showed no appreciable diminution, and the position of the scrap market offered little inducement to owners to break up their obsolescent vessels.

The figures of the tonnage and horse-power under construction in the chief shipbuilding countries at June, 1930, 1931, 1932, given in Table I, exhibit the extremely severe depression which has been afflicting shipowners and shipbuilders alike. While the figures appear to be fairly substantial for this country, the total tonnage in 1932 included 126,000 tons of steamers and 33,000 tons of motor ships on which work was suspended, and the totals are lower than any recorded for fifty years.

### RECIPROCATING ENGINE IMPROVEMENTS.

Possibly the outstanding feature of the year was the production of a considerable number of modified designs of steam engines by leading manufacturers, some of which reached the stage of being built and installed in vessels of moderate size.

Towards the end of 1931, the North-East Coast Institution of Engineers and Shipbuilders held a symposium in which several well-known engine builders took part by way of either a paper or

TABLE I.  
TONNAGE UNDER CONSTRUCTION IN CHIEF SHIPBUILDING COUNTRIES.

	STEAMERS.			MOTORSHIPS.		
	June, 1930.	June, 1931.	June, 1932.	June, 1930.	June, 1931.	June, 1932.
Great Britain . . .	556,800	339,700	245,370	831,000	213,400	34,780
France . . .	105,000	166,100	84,740	81,500	45,800	43,390
Germany . . .	73,000	12,000	2,200	164,500	118,400	101,300
Holland . . .	14,200	5,300	435	173,200	103,000	48,140
Belgium . . .	13,200	—	—	—	2,200	4,860
Italy . . .	65,200	103,300	101,520	77,100	67,300	79,050
Norway . . .	25,300	9,000	1,840	14,700	13,800	9,260
Sweden . . .	11,100	9,300	5,830	115,800	101,100	83,370
Denmark . . .	11,400	3,500	2,925	104,600	87,100	17,450
Japan . . .	10,600	6,400	19,850	111,000	39,900	23,820
Spain . . .	3,500	200	—	62,000	60,500	33,270
U.S.A. . .	193,600	284,000	161,400	35,700	15,100	800
Total . . .	1,082,900	938,800	626,110	1,771,100	867,600	479,430
Per cent. change compared with 1930 . . .	—	—18½%	—42½%	—	—51%	—73%
Per cent. change compared with 1931 . . .	—	—	—33½%	—	—	—44½%

## HORSE-POWER UNDER CONSTRUCTION.

	STEAMERS.			MOTORSHIPS.		
	June, 1930.	June, 1931.	June, 1932.	June, 1930.	June, 1931.	June, 1932.
Great Britain . . .	468,100	425,400	290,970	432,000	134,400	22,310
France . . .	100,500	109,300	196,800	51,500	44,500	33,390
Germany . . .	65,200	31,000	4,450	233,600	168,400	90,650
Holland . . .	8,900	5,800	1,450	88,300	81,700	39,540
Belgium . . .	46,500	700	700	3,000	2,100	20,200
Italy . . .	8,100	239,300	237,000	127,900	112,000	69,800
Norway . . .	28,500	13,000	700	8,000	6,000	3,000
Sweden . . .	10,900	4,500	6,300	91,500	91,800	65,410
Denmark . . .	10,300	2,000	3,175	158,200	87,800	18,200
Japan . . .	11,200	6,500	15,200	91,300	27,700	22,700
U.S.A. . .	186,500	339,000	182,200	31,100	13,800	5,710
Total . . .	944,700	1,156,500	923,745	1,302,600	770,200	390,910
Change compared with 1930 . . .	—	+ 22%	—2%	—	—41%	—70%
Change compared with 1931 . . .	—	—	—20%	—	—	—49½%

a contribution to the discussion. This symposium was framed with a view to ascertaining whether the improvements obtainable in reciprocating engines justified their extra cost, and the general consensus of opinion was that they did warrant a moderately increased initial expenditure. The outstanding features of the

papers were, however, the indication of the different lines of attack on the problem and the number of firms submitting proposals, all with the object of reducing fuel bills and maintenance costs. Practically all the various designs envisaged superheated steam, and the mechanical modifications were confined to the methods of its distribution and the phases of its cycle through the cylinders. Three firms, Messrs. Beardmore, Messrs. Dickinson (Lentz), and the North Eastern Marine Engineering Company, embodied poppet valves in their designs (the last-mentioned in the high-pressure cylinder only); Messrs. Christensen & Meyer and Messrs. Dickinson four-cylinder compound engines, the former with semi-uniflow low-pressure cylinders; Messrs. Richardsons Westgarth a triple-expansion uniflow; and Messrs. G. Clark a four-cylinder triple with direct flow, but with only two piston valves controlling both admission and exhaust from the four cylinders.

Later the Central Marine Engine Works installed poppet valves in quadruple engines in the Kewickhall and Siltonhall (the design has been called the "Quadropod"), while Messrs. Stephen & Sons designed and built an engine for the *Annan* in which separate inlet and exhaust valves of the balanced slide design, operated by cams, are fitted, these valves being to the proposals of Messrs. Andrews & Cameron. These valves were also fitted in engines by Messrs. Rowan for the new Harrison Line cargo tonnage, and they were adopted for a new high-pressure cylinder in the Ellerman liner *City of Christiana*.

The advantages of poppet valves, and also of the uniflow principle, are now more generally realised, and the adoption of these two characteristics, together with less cumbersome and more flexible valve-operating gear, in association with superheated steam of moderate pressure and temperature, appears to be the most probable trend of progress. This view is confirmed by the paper, and the discussion on it, read before the Institution of Naval Architects at their Spring Meetings, on "Fuel for Merchant Ships," by Mr. J. Johnson, the Chief Superintendent Engineer of the Canadian Pacific Company. He submitted a proposal for a 2,000 i.h.p. engine for a cargo steamer having an enclosed forced-lubricated quadruple-expansion engine fitted with poppet valves and working with a steam temperature and pressure of 700 deg. F. and 250 lb., and while the selected figures were thought by several of the contributors to the discussion to be higher than was warranted in view of the desirability of simplicity and low costs of fuel and maintenance, the general principle was apparently acceptable. These remarks apply, of course, to the reciprocating engine only; systems for its use in combination with a turbine are considered below.

Mr. Johnson's paper, which received wide appreciation, was really a plea for coal-fired steam plant able to use oil as occasion demands, as against the rival internal-combustion engine which is limited to liquid fuel only.

This period of extraordinary activity among the steam engine manufacturers is probably due, at least in part, to their taking advantage of the slackness of production of normal machinery to



have an intensive study made by their staffs, who in the ordinary times would be otherwise engaged, of the means available for improvement of the reciprocating engine, in order to be in a position to offer attractive proposals to owners when the state of trade improves.

Curiously enough, there does not appear to be the same stimulus at work in design in the internal-combustion engine field, possibly because the potential gains to be realised are much smaller. In this branch the principal avenue of advance is undoubtedly a reduction of first cost, to which end standardisation is the chief gateway, but except among a very few well-known firms the volume of work possible in the near future is not such as to justify the inauguration of mass-production methods. Moreover, in this country at least, the popularity of the Diesel engine is certainly not increasing, as will be seen from Table I, and it is a remarkable fact that of the makers of marine Diesel engines in this country the larger proportion had not, in the latter part of the year, a single set going through their works.

#### BOILERS AND FUEL.

During the summer the experiment of the Cunard Company in fitting their *Scythia* to run partially on an emulsified fuel of coal dust suspended in oil received much attention in the Press, but very little has since been heard of the matter. It did not seem to be realised that many years ago experiments with this so-called colloidal fuel were made both in the United States and this country, but at that time means for maintaining stability over a period of months were not known. It is understood that this difficulty has been surmounted, but whether the experiment has been sufficiently encouraging to warrant its more widespread adoption has not been disclosed. It is possible that the cost of preparation and the necessity for providing special stowage ashore in readiness for re-fuelling at the terminal ports may, until further facilities are available, militate against its more extensive use. Technically, it is understood, the voyage result was highly successful.

Pulverised fuel for marine work remains, like every other branch of the industry, in a state of suspended animation, although a Japanese vessel, with Clarke Chapman design of plant, was put into commission and another nearly completed. The *Gogra*, of the British India Line, was also converted to the Howden-Buell system, following upon the more or less experimental installation fitted in the *Hororata*.

Steam generating plant generally showed little or no change during the period under review, but an extraordinary volume of work was carried out, principally on the North East Coast, in converting saturated-steam machinery to superheat, this probably providing the only branch of the industry in which activity was observable. An interesting series of trials was undertaken on the German steamer *Uckermark*, in which a boiler of the Benson type is fitted, with the object of ascertaining the effect of progressively increasing the salinity of the feed water. From the reported results

it would appear that the commonly apprehended risk of damage from the admission of salt water to high-pressure water-tube boilers has been taken somewhat too seriously, since the boiler apparently behaved well, even with fairly heavily contaminated feed water.

### EXHAUST STEAM TURBINES.

The exhaust steam turbine, which in the last few years has been fitted to some 200 vessels, both new and old, was naturally affected by the general depression, but the success of the original Bauer-Wach system has been so marked that, as was inevitable, several competitive systems have been introduced, and in some cases put into service. Of these alternatives, Messrs. Parsons have not, it is understood, fitted any further sets beyond that in the Kingswood, mentioned last year. Messrs. Brown Boveri's three ships *Blitar*, *Ammon*, and *Amasis* have been on service with results which are stated to be satisfactory. The Lindholmen exhaust-turbo electric system fitted in the *Trione* has not, as far as is known, been repeated, but the published service results have not confirmed the figures stated to have been obtained on trial. It will be recollected that in this design the exhaust turbine drives an electric generator, the current from which is partly used to heat the steam issuing from the high-pressure cylinder before its entry into the intermediate-pressure cylinder. In the *Gotaverken* system, fitted in the *Braheholm*, for which a repeat order has been given for the Swedish American Mexico Line, the exhaust steam from the high-pressure cylinder is raised in pressure and temperature by means of a *Ljungström* compressor directly coupled to the spindle of the exhaust turbine. The economy claimed on the first example is 17½ per cent. Both these systems are designed for economy rather than for increase of power, as the higher pressures involve additional stresses on the engines in converted ships, for which they are ordinarily not designed.

The White design, of which an example was built and run on the test bed, bears a strong family resemblance to the Parsons and Brown-Boveri designs, in that flexible spring-controlled couplings are interposed between the reciprocating engine and the line shafting; but in it the main engine is a fast-running unit geared down.

Another design, specially adapted for small craft such as trawlers, has been evolved by the *Helsingor Shipbuilding and Engineering Company*, and consists of a geared exhaust steam turbine with a mechanical clutch arranged adjacent to the low-pressure cylinder exhaust pipe, and transmitting its power through a chain drive to the main shaft. This scheme has been fitted in the *Grete* and *Ulla*, two small Danish vessels.

The system of electric transmission from the exhaust steam turbine to a motor on the propeller shaft has not been fitted in any further existing vessels, but was installed as a part of the main propelling equipment, in conjunction with a four-cylinder triple-expansion engine, in the *Erin*, a fruit carrier built by Messrs. *Workman Clark*, Belfast. The turbine and gear are of the *Metropolitan*-

Vickers design, the layout being somewhat similar to that of the Ellerman liner *City of Barcelona*, mentioned in last year's article.

Among notable conversions to the Bauer-Wach system was the Norwegian American liner *Stavangerfjord*. The installation has enabled two days to be cut off the round trip between Bergen and New York, with an annual saving of 2,000 tons of oil fuel, and the results were so successful that the owners decided to convert their *Bergensfjord*. The system was also adopted for the large French liner *Maréchal Lyautey*. In this country the *City of Khios* and *City of Bedford* for the Ellerman Line have been converted, as well as the *Cumberland*, *Huntingdon*, and *Norfolk* of the Federal Line.

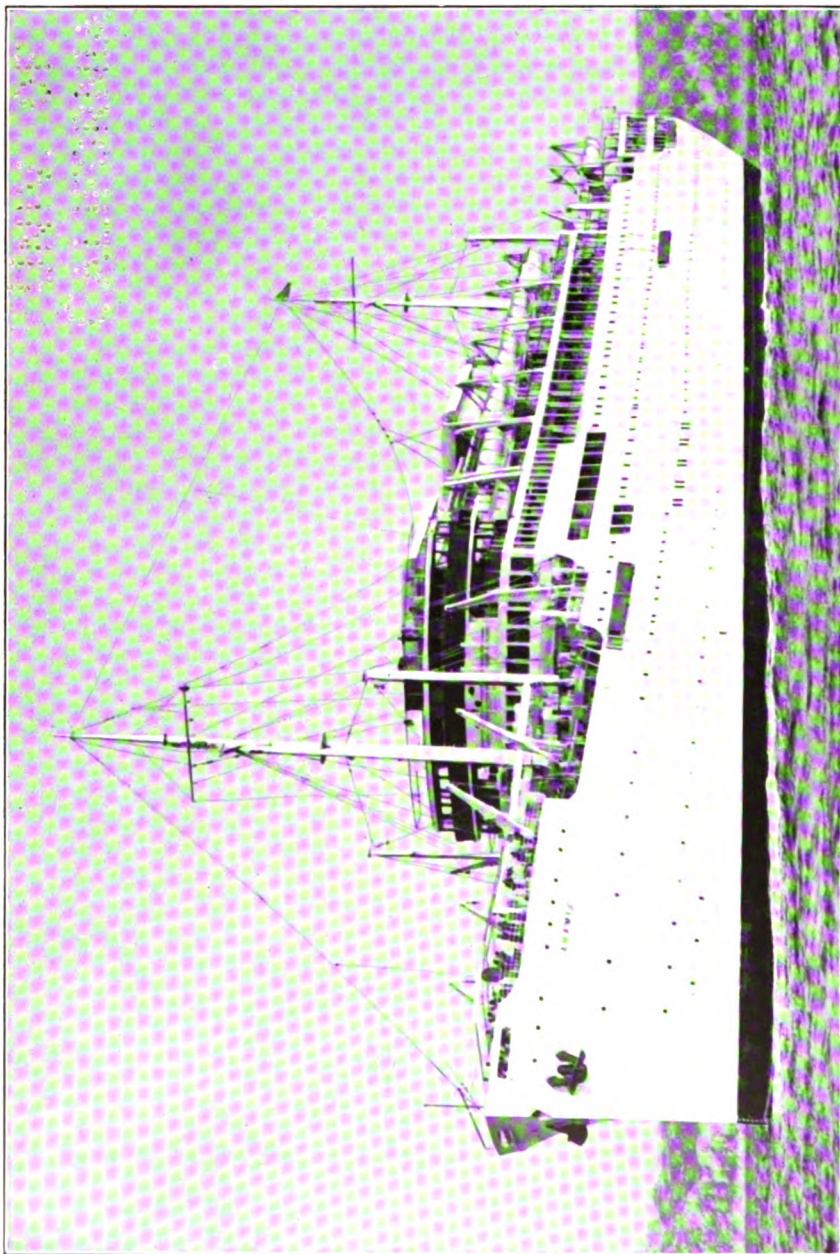
#### TURBINES AND TURBO-ELECTRIC DRIVE.

Pride of place as being the highest powered vessel put into service during the year is taken by the liner *Rex* for the United Italian Steamship Companies. This vessel ran trials in September and was put into service in October. The other large liner for the same company, *Conte di Savoia*—notable for having gyroscopic stabilising equipment—went into service somewhat later in the year. The machinery of these two vessels is modelled on that of the *Empress of Britain* and the new Cunarder on the stocks at Clydebank, in that there are four single-reduction high-pressure turbine units, supplied with steam from water-tube boilers, the pressure and temperature being about 420 lb. and 725 deg. F. respectively, and the power about 140,000 h.p.

The new French liner *Normandie*, launched at the end of October, is to have turbo-electric drive of 160,000 s.h.p., with 29 boilers of similar characteristics to those of the Italian and latest British ships, which conditions have practically become standardised for this type of vessel. The same drive is employed in the P. & O. liner *Strathaird*, which was put into commission early in the year, and in the *Queen of Bermuda*, practically completed by Messrs. Vickers-Armstrongs, which is a sister in all important respects to the *Monarch of Bermuda*, built by the same firm for Messrs. Furness Withy & Co.'s *de luxe* service between New York and Bermuda.

In the United States the Matson liner *Mariposa*, of 22,000 s.h.p., with single-reduction geared turbines and steam at 375 lb. and 650 deg. F. from Babcock boilers, has given a consumption figure of 0.627 lb. of oil per s.h.p., a figure distinctly higher than that obtained in the most recent Canadian Pacific vessels. A sister ship the *Monterey* was put into service, and the third of the trio, the *Lurline*, is still in hand. Turbo-electric drive is apparently not now so favourably regarded in the United States for the largest vessels, although a few intermediate vessels are being so equipped, among them the fifth of a group of six for the United Fruit Company, the *Veragua*, of 10,500 s.h.p. The latest American productions, the *Manhattan*, now in service, and the *Washington*, approaching completion, adhere to the three-turbine single-reduction geared arrangement of which the Canadian Pacific "*Duchess*" and "*Empress*" classes were the prototypes. These two ships have 30,000 s.h.p. with

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MESSAGERIES MARITIMES' LINER ARAMIS.  
(Builders, *Chantiers de la Méditerranée.*)

six Babcock boilers of 375 lb. pressure and 682 deg. F. temperature, and the first ship has been stated to have a consumption of 0.595 lb.

#### INTERNAL-COMBUSTION ENGINES.

The production, at any rate for Great Britain, of internal-combustion engines was very limited. The chief British vessels put into service were the White Star liner *Georgic* and the Nelson liner *Highland Patriot* replacing the *Highland Hope* lost off the Portuguese Coast; both have B. and W. double-acting four-cycle engines supplied by Messrs. Harland and Wolff. Outstanding on the Continent were the *Neptunia*, a four-shaft Cosulich liner built at Monfalcone, and her sister *Oceania*, launched in September, which will be in service in the spring of this year. The machinery resembles that of the *Victoria* of the Lloyd Triestino Line, the two wing engines being 8-cylinder single-acting units of 4,250 b.h.p. each, and the inboard engines 9-cylinder engines of 4,650 b.h.p. each. In the first vessel the engines are of the Sulzer type, and in the latter of Fiat design. A notable French motor vessel completed during the year was the *Aramis*, for the Messageries Maritimes. This liner, which is the sixth large motor ship for this company, was built at the yard of the Forges et Chantiers de la Méditerranée, and takes the place of the *Georges Philippa*, lost by fire in the early part of the year. She has twin screws driven by Sulzer engines of 11,600 s.h.p.

Messrs. Burmeister and Wain fitted two of their latest design of 6-cylinder two-stroke engines in the East Asiatic Company's *Erria*, the total power being 9,500 i.h.p. A similar two-stroke engine with eight cylinders is to be fitted, it is understood, by Messrs. Kincaid in the new vessel ordered by Messrs. Burns Philp & Co. from Messrs. Barclay Curle & Co.

#### CROSS CHANNEL VESSELS.

The output of cross channel vessels was below the average, but there were one or two notable additions to the various fleets which maintain these services. Besides nearly completing the *Brighton* for the Southern Railway Company, a sister to the *Worthing* commissioned in 1931, and re-boiling and converting to oil fuel the *Paris* of the same company, Messrs. Denny and Brothers also delivered the turbine-driven cargo steamer *Slieve More* for the L.M.S. Railway Irish Channel service and completely re-conditioned the *Duke of Lancaster*, which was burnt and sunk at Heysham in the autumn of 1931. For the Fishguard-Rosslare service of the Great Western Railway, Messrs. Cammell Laird & Co. delivered the *St. David* and *St. Andrew*, which have the usual Parsons single-reduction geared turbines with Babcock & Wilcox boilers. Geared turbines were also fitted in the *Côte d'Argent*—a sister to the *Côte d'Azur*—which was launched in April and has since been put into commission in the Dover-Calais service, but Sulzer engines of 15,400 b.h.p. were specified for the *Princess Baudouin*, ordered from Messrs. Cockerill for the Dover-Ostend service. Internal-combustion engines of the B. & W. type were installed in the *England*, which was added

to the Harwich-Esbjerg service. A three-shaft direct-coupled turbine arrangement was adopted in the *Duchess of Hamilton*, delivered by Messrs. Harland and Wolff for the Clyde services of the L.M.S. Railway, and a triple-expansion engine with diagonal cylinders was fitted in the paddle steamer *Royal Eagle*, built by Messrs. Cammell Laird & Co. for the Thames-Kent coast service of the General Steam Navigation Company.

If stagnation on the productive side has had such deplorable results in the temporary closing of many engineering works in the country, the effects on the industry in the future are likely to be felt even more seriously. The reduced volume of work has meant the laying off of a very large percentage of skilled staff, who, with little prospect of re-employment in their own trades, migrate to other fields where their particular art is not utilised. Lack of practice must result more or less in atrophy of their abilities, so that when a revival does occur in shipbuilding and marine engineering the necessary personnel will no longer be available for executing the work with the efficiency and ability characteristic in the past of British work. So much has this superiority been appreciated that even in foreign-built ships a very large number of the products of home firms are utilised as being the best of their kind obtainable anywhere. Further, the rising generation has little or no inducement to become apprenticed to a trade or profession which offers so poor a return after a long period of indentures followed by a rate of remuneration which is invariably less than is obtained by workers—often only semi-skilled—in other spheres of activity.

Under these conditions, it is not surprising that the entries of apprentices into works have fallen to an extremely low figure, and in the course of a few years there will be a still further reduction in the number of trained engineers available to carry on the traditions of their predecessors. This paucity of skilled labour will in the near future be of a very serious character, and it is submitted that this phase of the industry is deserving of much more attention than it is at present receiving. Unless the conditions in the engineering and shipbuilding trades can be made more attractive in comparison with those obtaining elsewhere, the outlook for the maintenance of British supremacy in this particular field is extremely depressing. Even now, there will be a hiatus which will be very difficult to bridge should a rise in commodity prices in the near future stimulate the shipbuilding industry into unexpected activity.

R. J. BUTLER, M.I.N.A.

## CHAPTER XVI.

### NOTABLE MERCHANT SHIPS OF THE YEAR.

NOTWITHSTANDING a general slowing down of mercantile ship-building, the vessels turned out last year were of very interesting types. In nearly every case they were completed, so that it was a year of finishing off, with very little new construction left at its end save those contracts which were placed just before it concluded. The two largest ships completed were the *Rex* and *Conte di Savoia*, which in size eclipse anything constructed in a British shipyard since the *Aquitania* was launched in 1913. Indeed, it will be noted in the following descriptions that foreign shipyards, among them Italian, French, and American, turned out a number of vessels of large size, France achieving the distinction of launching the first ship over 1,000 ft. in length.

### BRITISH LINERS.

The White Star Line's *Georgic* is the second cabin-class motorship in its fleet. In general appearance she resembles the *Britannic*, but with a gross tonnage of 27,759 tons compared with the 26,943 tons of her sister, she possesses the distinction of being the largest motorship on the British register. She is 683 ft. 7 in. in length between perpendiculars, with a breadth moulded of 82 ft. 5 in., and a draught of 35 ft., and with a cargo capacity of 13,895 tons. She can carry about 1,632 passengers—cabin, tourist, and third-class. As in the *Britannic*, every cabin throughout all classes is fitted with hot and cold running water, and the cabins in the lower classes are of an exceptionally high standard of comfort and equipment so that the vessel is suitable for pleasure cruising. The forward end of the superstructure is rounded, whereas in the *Britannic* it is square. The distribution of the public rooms is also different, and the style of decoration entirely novel. Indeed, she probably represents the greatest advance in this respect of any British ship. The note is distinctly modern, with considerable boldness of colour schemes. The traditional smoke-room arrangement has been abandoned, the large apartment combining in its various sectors a cocktail bar, a smoking lounge, and an informal lounge. Different decorative treatments of the various sectors produce, nevertheless, a general harmonious scheme. The machinery—10-cylinder Harland B. & W. four-stroke double-acting oil engines—is almost identical with that of the *Britannic*. (Plate facing p. 102.)



The Highland Patriot was, like the Georgic, built at Belfast by Messrs. Harland & Wolff, and replaces the Highland Hope wrecked off Portugal in 1930. She is almost identical with that vessel, and is generally similar to the other four which comprise the new fleet of motorships in the Nelson Line service, now merged with Royal Mail Lines, and bearing the black hulls and yellow funnels of the Royal Mail in place of the very distinctive Nelson colours. She carries 135 first and 66 intermediate class passengers with about 600 emigrants. She is 540 ft. long and of 14,157 gross tons, and maintains a service speed of about 15 knots. There is a total refrigerated cargo space of 500,000 cu. ft., with about 60,000 cu. ft. for general cargo. Like her sisters, she is propelled by two Harland B. & W. oil engines each developing 4,800 b.h.p. at 105 r.p.m.

In many respects the turbo-electric liner Queen of Bermuda, launched at Barrow-in-Furness in August, is similar to the Monarch of Bermuda which Messrs. Vickers-Armstrongs built at their Tyne shipyard and which was described in the last issue of "Brassey." Some important differences, however, are being embodied in the light of experience gained with the Monarch of Bermuda, and a rearrangement of the engine-room is made possible by the omission of the lower swimming bath. Some of the smaller cabins are being enlarged, the number of passengers carried being somewhat reduced.

The fruit carrier Erin, built by Messrs. Workman Clark at Belfast, is for service between Central America, the West Indies, and Europe. She has fourteen large insulated holds with a special space forward for citrus fruit. Independent refrigerated chambers have been installed for the ship's provisions and passenger requirements. The passenger accommodation is not large, only twelve passengers being carried, but the standard of comfort is high. There are two special state rooms with private lavatories and the cabins are fitted with bedsteads. The vessel is 431 ft. long, with a tonnage of 5,850 gross tons, and has 270,000 cu. ft. capacity for fruit, the insulated space for crew and passenger use being 1,750 cu. ft. additional. The machinery consists of a four-cylinder triple-expansion engine coupled to a Metropolitan-Vickers exhaust turbo-generator and propulsion motor. This combination develops a maximum continuous service power of 6,400 i.h.p. at 90 r.p.m. The steam from the low-pressure cylinders passes to the turbo-generator set on the port side of the engine-room at top platform level, and thence to the main condenser. When the exhaust turbine is not in operation, as when manœuvring or running astern, the steam is by-passed direct to the condenser. The generator is rated at 1,260 kw. at 550 volts and 600 r.p.m., the speed being reduced from the 3,000 r.p.m. of the turbine through single-reduction gearing. The current generated is supplied to the propulsion motor directly mounted on the propeller shaft immediately aft of the main engine and thrust block. This propulsion motor develops 1,820 s.h.p. In addition to driving the generator for propulsion-motor current, a second generator is directly coupled to the main generator to supply the auxiliary power required for driving the fruit-cooling fans and various auxiliaries.

## FRENCH LINERS.

Among French ships pride of place must be accorded to the mammoth Cie. Générale Transatlantique liner launched at St. Nazaire at the end of October. As the name given her, Normandie, was not settled until shortly before the launch, she had become known all over the world as T6. She has an overall length of 1,028 ft., an extreme breadth of 119 ft. 4 in., and a mean draught loaded of 36 ft. 7 in. Her gross tonnage is approximately 75,000 tons, and she will carry 930 first, 680 tourist, and 560 third-class passengers. In many respects she is an unusual vessel of striking appearance, with three large and well-raked funnels, a form of clipper stem, with turtle deck forward, and a counter stern. Underwater she is of peculiar form, with a bulbous bow, although not the large bulb of the Bremen. She is to have four screws with turbo-electric machinery developing about 160,000 s.h.p. Steam is to be generated in 29 water-tube boilers of the Penhoët type at 400 lb. pressure and 662 deg. F. superheat. The designed speed of 28 knots will, it is anticipated, enable the vessel to make the Havre—Plymouth—New York run in less than five days. (Plate facing p. 160.)

There are several novel features about the cabin-class liner Champlain, also for the Cie. Générale Transatlantique, which, unlike her earlier sister, the motorship Lafayette, is propelled by single-reduction geared turbines. One is the peculiar shape of her single funnel, with inclined baffle plates forward to prevent the smoke from falling on the large sun deck. Another is the arrangement of the ventilating plant, which is housed in the superstructure and entirely concealed, so that the decks are free from all obstructions. This arrangement has given to the Champlain a series of sports decks unequalled in any other liner. The whole of the cabin-class promenade deck (328 ft. long) is glazed in, and is covered with thick rubber tiling, to prevent disturbance to the passengers beneath. On some of the cabin-class decks the cabins are grouped and partitioned off from the general distribution in such a way that there is a bathroom and toilet for each pair. This arrangement is in addition to the ordinary toilet and bath facilities. There is accommodation for 643 cabin, 248 tourist, and 122 third-class passengers, with running hot and cold water in all the cabins of the first two classes. The decoration is in distinctly modern style, with striking colour and lighting effects. With a length of about 641 ft. and a measurement of about 28,000 tons gross, the Champlain is propelled by two sets of Parsons turbines developing 25,500 s.h.p. at 127 r.p.m. of the propellers and giving a service speed of about 20 knots. Steam is provided by six Penhoët water-tube boilers working at 400 lb. per sq. in., the highest pressure yet employed in the Cie. Générale Transatlantique fleet. She is also the first Cie. Générale Transatlantique vessel to have water-tube boilers, which are insulated with glass silk. (Plate facing p. 144.)

The motorship Aramis, 17,400 tons, built for the Marseilles—China—Japan service of the Messageries Maritimes at the Chantiers de la Méditerranée, is a sister ship to the Georges Philippa, which

was lost at sea through fire when on her maiden voyage in May last year. (Plate facing p. 181.)

The Pascal Paoli, of 2,950 gross tons, was built for the Cie. Fraissinet's Marseilles—Corsica service by the Chantiers et Ateliers de Provence. One rather squat funnel centred on the superstructure decks gives her an appearance more closely associated with motor-ships. She carries about 70 first, 72 second, and 28 third-class passengers. There are six suites *de luxe*, and all first-class state rooms have hot and cold running water. A large glazed portion forward is arranged as a verandah café and leads to the smoking-room. Propulsion is by two sets of Rateau-Bretagne double-reduction geared turbines driving a single screw and developing about 3,500 s.h.p. at 115 r.p.m. of the propeller shaft. The service speed is about 16 knots. Steam is supplied by four oil-burning Prudhon-Capus boilers at 284 lb. pressure and superheated to 662 deg. F. A speed of 18.95 knots was reached on trials.

For the sheep and general cargo trade between France and Algeria the Cie. Générale D'Armements Maritimes took delivery of the Allier and Ardèche, built respectively by the Chantiers de France at Dunkerque and the Chantiers de Normandie yard at Grand Quevilly. They are 344 ft. long, and carry about 2,400 tons on a draught of 19 ft. 6 in. There is accommodation for ten passengers, four in two-berth and six in three-berth cabins on the boat deck. Propulsion is by Parsons single-reduction geared turbines driving a single screw at 120 r.p.m., steam being supplied by four Prudhon-Capus boilers working at 255 lb. pressure, oil-burning under forced draught.

El Kantara, a twin-screw vessel for the Cie. de Navigation Mixte Marseilles, was built on the Tyne at the Neptune Works of Messrs. Swan Hunter & Wigham Richardson for the express passenger service between Port Vendres and Algiers. She is 397 ft. long and of 5,210 gross tons, carrying about 1,400 tons of cargo on a draught of 18 ft. 2 in. There is accommodation for 104 first-class, 154 second-class, and 102 third-class passengers. The vessel is not particularly large, but by grouping the public rooms, which are decorated in modern French style, an imposing effect of spaciousness has been obtained. The vessel has a strikingly handsome appearance, with a cruiser stern and two well-balanced funnels, the bold lines of the high superstructure decks being carried well forward. The propelling machinery consists of twin sets of Parsons single-reduction geared turbines supplied with steam by five oil-burning Prudhon-Capus boilers of the combined water-tube and cylindrical type working at 285 lb. pressure.

Among other French-owned ships constructed outside that country, Messrs. Burmeister & Wain built at Copenhagen the motor tanker Henry Desprez for the Cie. Auxiliaire de Navigation, Paris. This is a vessel 156 ft. long with about 15,180 tons carrying capacity. The capacity of the central tanks is 10,755 cubic metres, and that of the side tanks 8,552 cubic metres, making the total capacity 19,307 cubic metres. The hull is built on the Isherwood longitudinal bracketless system with two longitudinal bulkheads, and is divided

athwartships by nine bulkheads, making nine tank sections, each having one central tank and two side tanks. All the cabins for the officers and the crew are large, pleasant, and well furnished. The vessel is propelled by two Burmeister & Wain four-stroke cycle single-acting 8-cylinder Diesel engines of the cross-head type, and air injection of the fuel oil is used. The normal total output of the engines is 5,600 i.h.p. at 120 r.p.m.

#### ITALIAN LINERS.

Three large liners were put into commission by Italy within a few weeks of one another. These in order of entering service were the *Rex*, *Neptunia*, and *Conte di Savoia*.

The largest of them, the *Rex*, of 51,062 tons, was built by the Ansaldo Shipbuilding Company for the Italia Line, the combine of Cosulich-Lloyd Subaudo and N.G.I., and has a length of 834 ft. and a breadth of 97 ft. moulded. She is a handsome vessel with a slightly raked stem, a full counter stern and two well-proportioned funnels, which are widely spaced and placed fairly well forward of the vessel's length. As in many large liners built during the last few years, the superstructure decks are well rounded forward, and use is made of this arrangement for spacious verandahs and covered promenades. Swimming pools and sun decks are a special feature, and the Turkish baths, the solarium and massage treatment rooms are supplemented by the addition of an X-ray department. The grand ballroom has a stage with dressing-rooms. The dining saloons are rather higher up than usual but not so high as in some modern German ships, and there has been no attempt by such an arrangement as divided uptakes to give a long vista on this deck. Just forward of the first-class dining saloon is a chapel, which is followed by a long range of single and two-berth cabins, the tourist and third-class dining saloons being well forward. A large number of the tourist-class cabins, which are mainly on the deck below, are two-berth, and some are single-berth. The ship is propelled by four sets of Parsons single-reduction geared turbines with fourteen oil-fired water-tube boilers. The electrical generators are driven by oil engines of the M.A.N. type built in Italy. (Plate facing p. 112.)

The *Conte di Savoia*, although often referred to as a sister ship to the *Rex*, is dissimilar in many particulars. She is rather smaller, of 48,500 gross tons. She has a cruiser stern compared with the more formal counter stern of the *Rex*, and the general arrangement of the passenger spaces is entirely different. She is also unique as being fitted with a Sperry gyro-stabiliser, the largest installation of its kind and an experiment which will be watched with interest. This stabiliser is situated well forward about midway between the forefoot and the first of the two funnels and well down in the ship. A special feature of the arrangement of the decks is the provision of large curved and covered-in promenade spaces forward of the superstructure decks; one of these is treated as a winter garden and leads aft to a comfortable smoking-room which has been called "The Club." Indeed, fanciful names are given to most of the public rooms, such

as "Lido Club" and "Great Hall." There has, in these ships, been a definite break with the traditional division of the public rooms into lounge, smoking-room, drawing-room, and so on, and each of the upper decks possesses rooms which can be used in the various ways. The swimming pool is an open-air one on the sports deck, but farther aft, on what is called the social deck, there is another, covered in and known as the winter pool. Exceptional deck space has been provided for games, these facilities being extended to the tourist and third classes; the latter, for example, has a covered verandah and a winter garden. The Conte di Savoia was built at the Cantieri Riuniti dell' Adriatico, San Marco, and is 790 ft. long with an extreme breadth of 96 ft. Her water-tube boilers are of the latest Yarrow high-pressure type, designed by Messrs. Yarrow and constructed under licence by the Cantieri Riuniti. Including Yarrow superheaters and airheaters, they embody improvements which increase efficiency and reduce the space occupied in relation to the amount of steam produced. (Plate facing p. 128.)

The Cosulich motor-liner *Neptunia*, of about 20,000 tons gross, went into service in October, and a sister ship, the *Oceania*, was launched at the end of September. Both were built by the Cantieri Riuniti dell' Adriatico and are for the Trieste—South America service. There is accommodation for 175 cabin, 710 third, and 648 steerage classes. The vessels have a length overall of about 590 ft. and a draught of 27 ft. 6 in., and carry about 7,150 tons of cargo. The service speed is 19 knots. They differ in appearance from their precursors, *Saturnia* and *Vulcania*, by having a well-raked bow and a cruiser stern. A novelty for a motorship is the introduction of the divided uptake, first employed in the *Vaterland*, and taking advantage of this arrangement the designers have, as in a number of German ships, put the dining saloon high on the superstructure decks next to the lounge and smoking-room. The smoking-room, as in many modern ships, is forward, and the kitchen and pantry for the first class is just aft of the dining saloon on the same deck.

#### AMERICAN LINERS.

The large ships built in American shipyards include the *Manhattan* and *Mariposa*.

The *Manhattan*, for the New York—European service of the United States Lines, made her maiden voyage in August. She is the largest ship yet built in an American shipyard, and is 705 ft. long with a gross tonnage of 24,290 tons. She carries cabin, tourist, and third-class passengers, accommodation being arranged for 1,254 in all. She has two widely spaced funnels, a slightly raked bow and a counter stern. She was built by the New York Shipbuilding Company, Camden, N.J. The public rooms are decorated on a particularly lavish scale, and the boat deck is arranged to be entirely clear between the rail and deck-house. There is a large swimming pool with elaborate under-water lighting effects. A twin-screw vessel, she is propelled by single-reduction geared Parsons turbines developing 30,000 s.h.p. and giving a speed of 20 knots.

Steam is generated in six Babcock & Wilcox oil-fired water-tube boilers with superheaters. (Plate facing p. 192.)

The *Mariposa* is the first of three sister ships ordered from the Bethlehem Shipbuilding Corporation, Quincy, Mass., for the Matson Navigation Company of San Francisco, for the San Francisco—Australia service. They are 632 ft. long, of 18,017 gross tons, and have a service speed of 20½ knots. They have nine decks, four of which are almost entirely for passenger accommodation and public rooms. They carry 475 first and 230 second-class passengers. In decoration and furnishing the two classes are almost identical, so that the ships can be employed as one-class ships if necessary. A feature of the general arrangement is that the main engine-room occupies an unusually small portion of the ship's length. The fuel-oil tanks have a greater capacity than is required for a round trip between California and Australia. No expansion joints are used. There are special arrangements for carrying motor cars. Two swimming baths are incorporated in cargo hatches.

For the New York, Haiti, Jamaica, and Colombia run the Colombian Line has put on service two fast liners, the *Colombia* and *Hayti*. They are about 405 ft. long and accommodate 120 first and 24 tourist-class passengers all in outside state rooms. The public rooms follow the modern Spanish style in decoration, the passenger amenities including a tiled swimming bath with a verandah café adjacent. Propelled by geared turbines the vessels have a speed of 18 knots, and are stated to be the fastest on this route which is very popular during the winter months.

Two 22-knot vessels have been put on the New York—Yarmouth, N.S., run of the Eastern Steamship Company, New York. These are the *St. John* and *Acadia*, steamers 403 ft. in length with a gross tonnage of 6,190 tons and carrying about 2,495 tons on 20 ft. draught. The run is made in just under 24 hours and very luxurious accommodation is provided for 750 passengers. There are 266 state rooms, 77 of them being *de luxe* with private baths or showers. All are fitted with hot and cold running water, and each has a telephone.

### CARGO SHIPS.

A number of yards, particularly on the Continent, have been employed in building tankers, which represent the last of the large number of contracts placed rather more than two years ago. There has been practically no ordinary cargo tonnage built, but some specialised types of cargo carriers of more than average interest have been turned out.

Among purely cargo vessels considerable interest has been aroused by the series of eleven ships built and building for Messrs. J. & C. Harrison. The contracts were divided between three builders—Messrs. Hawthorn Leslie & Co., Hebburn; Messrs. Lithgow, Port Glasgow; and Messrs. William Gray & Co., West Hartlepool. They include the *Harbro*, *Harlesden*, *Hartlepool*, and *Harmantel*, names which are sufficiently indicative of the series. They are single-screw steamers 440 ft. 6 in. long with a beam of 56 ft. 3 in.,

a measurement of about 5,460 gross tons, and a deadweight capacity of 9,000 tons. The officers and engineers are accommodated amidships and the crew in the poop. The builders were left to formulate the details of design after the general principles had been settled, and the resulting competition had the effect of introducing a number of innovations, as each builder was anxious to produce the most economical ship. Similarly, although triple-expansion engines and Scotch boilers were specified the latest developments of the respective marine engineers were embodied in the machinery.

The *Alexander Kennedy*, which was built by the Burntisland Shipbuilding Company and ran trials in September, is intended to carry coal to the new power station of the London Power Company at Battersea. She is 227 ft. long and can carry about 2,000 tons of coal. Great care was exercised in the design, particularly in regard to draught and trim in both ballast and load conditions, and the overhead clearance was precisely calculated so that the vessel may be able to pass under the twelve low-span bridges of the Thames to Battersea. The funnel and mast are arranged to lower, while the wheelhouse is of collapsible construction. Propulsion is by triple-expansion steam engines. The *Alexander Kennedy* was followed by the *Tyndall*, built on the Wear by Messrs. S. P. Austin & Sons.

The *Berganger*, the first of three motorships ordered from the Netherland Shipbuilding Company, Amsterdam, by Westfal-Larsen & Co., Bergen, was completed in August. These vessels are 486 ft. long and carry 9,400 tons on 26 ft. 10 in. draught. There is in all about 106,000 cu. ft. of refrigerated space, part of it designed for the carriage of fruit or eggs, with a special hold for frozen fish. Derricks capable of dealing with heavy lifts are fitted, one having a capacity of 25 tons. All the deck machinery is electrically driven. The vessel is propelled by a single screw, the engine being a double-acting two-stroke Diesel of the A.E.G. type capable of giving a speed of about  $15\frac{1}{2}$  knots. There is accommodation for twelve passengers in six two-berth cabins.

Two 15-knot motor cargo ships for companies controlled by Mr. A. P. Moller were built, the first to go on service being the *Peter Maersk*. Built at Mr. Moller's Odense Shipyard and engined by Burmeister & Wain, Copenhagen, they are 441 ft. long, and carry 8,880 tons on a draught of 25 ft. 9 in. Four two-berth and two single-berth cabins with private bathrooms are provided for passengers.

#### CHANNEL AND PLEASURE SHIPS.

The Great Western Railway Company put on the Fishguard—Rosslare service two 21-knot geared turbine steamers, *St. Andrew* and *St. David*, both being built by Cammell Laird & Co., Birkenhead. They, with the *St. Patrick* built in 1930, replace the *St. Andrew*, *St. David*, and *St. George* which inaugurated this service. The new ships are 325 ft. long, and have a distinctive appearance with their straight stem, cruiser stern, two steel masts and single funnel. There are four passenger decks. The first-class passenger accommodation is arranged mostly amidships in single and two-berth

state-rooms on the boat, promenade, and main decks. There are four single-berth *de luxe* cabins on the boat deck. The third-class is aft, and on the promenade deck forward are twelve single-berth *de luxe* cabins with wooden cot beds. Sixty double-berth cabins are arranged on the main deck. There are large open sleeping spaces on the lower deck forward, one for women and one for men, the berths being arranged in two tiers. The cargo holds have a total capacity of about 49,000 cu. ft., and electrically driven refrigerators are provided for dealing with food cargoes of a perishable nature. The cargo hatches are of Reith's patent design, one of the features of which is that the usual projections, such as shoes or lugs, are no longer inside the hatch coaming, but are clear of the actual shipping space. The main deck has been laid out for motor cars. Two sets of Parsons turbines, aggregating about 8,000 s.h.p., drive the twin screws through single-reduction gearing, steam being supplied at 230 lb. by four Babcock & Wilcox oil-fired boilers.

The Isle of Sark, 306 ft. long, of 2,210 gross tons and carrying 1,350 passengers, joined the Channel Islands fleet of the Southern Railway. Although she is in many respects similar to the Isle of Jersey and Isle of Guernsey, built in 1930, her appearance is different because of her Maier-form bow. She has not the full Maier form, but is of what has been described as a modified Maier-form type. The owners, it is understood, were unwilling in the first application of this novelty to accept the full extent of "cut up" forward which would have attended the adoption of the complete Maier form. She is, however, the first ship in Britain to adopt the Maier form, which, as experience has shown in comparison with her sister ships, is particularly useful in the seas met on the Southampton—Jersey run. The vessel was built and engined by Messrs. William Denny & Bros., Dumbarton. The first-class passenger accommodation includes a general lounge, ladies' lounge, gentlemen's lounge, dining saloon, smoke-room, and entrance lounge, two two-berth cabins-*de-luxe*, nineteen two-berth private cabins on the promenade deck, sixteen one-berth private cabins on the main deck, and thirteen two-berth, two three-berth, and two four-berth private cabins on the lower deck. All are fitted with hot and cold running water, and there are plunge bathrooms and shower-baths. Second-class passengers are berthed in open saloons aft. Propulsion is by two sets of Parsons single-reduction geared turbines. Steam is generated by two Yarrow water-tube boilers and one single-ended Scotch boiler working at 250 lb. per sq. in.

The England is the latest of the series of fast motor passenger ships built for the Harwich—Esbjerg route of the United Steamship Company. She was built at Elsinore, and is propelled by two sets of Burmeister & Wain super-charged four-stroke airless-injection engines which give a speed of 16 knots, enabling the journey to be made in 22 hours. The length is 321 ft. and the draught 18 ft. 2 in. In addition to comfortable passenger accommodation on a considerable scale the vessel carries about 1,720 tons of cargo, a large part of the space being insulated for refrigerated produce.

Two single-screw steamers, the Courland and Gothland, put on



the Leith—Hamburg service of the Leith, Hull, and Hamburg Steam Packet Company, are 250 ft. long and of about 1,300 gross tons. They carry about 1,680 tons of cargo, and have accommodation for fourteen passengers in exceptionally large cabins. Triple-expansion steam engines are installed. The Courland was built and engined by Messrs. Barclay Curle & Co., Glasgow, who also engined the Gothland, built by Messrs. Henry Robb, Leith. Their speed is about 13 knots.

Messrs. Harland & Wolff built at Govan the triple-screw passenger steamship *Duchess of Hamilton* for the Clyde service of the L.M.S. Railway. She is a one-class vessel 260 ft. long, and she has four passenger decks, of which two are totally enclosed, one is partially enclosed, and one is open. There is an observation lounge on the promenade deck. A special device is fitted to keep the decks free from soot or ashes. For easy manœuvring there is a bow rudder as well as a stern rudder of the semi-balanced type.

The removal of the terminal pier for large pleasure steamers on the Thames to just above the Tower Bridge avoids some of the disabilities associated with London Bridge, and full advantage was taken of the change in designing the latest Thames paddle steamer *Royal Eagle* for the General Steam Navigation Company's service to Margate and Ramsgate. The result has been to create a new type, larger, and with an extra deck and greater covered-in space. Built and engined by Messrs. Cammell Laird & Co., the *Royal Eagle* has a length of 290 ft., an extreme beam over sponsons of 68 ft. 10 in. and a speed of  $17\frac{1}{2}$  knots. She has a straight stem, two pole masts, and one funnel. The after rudder is stream-lined, and there is also a bow rudder. One of the new features is a sun deck which forms the roof of a large deck shelter arranged on verandah café principles and seating 194 persons. Sliding and fixed windows all round make this space a commodious observation lounge, and passengers have the use of it for a small supplementary charge. The deck is covered with rubber tiling, and a very high standard of comfort has been reached. There are two large dining saloons on the main deck. One aft seats 126 and the other forward 100, at tables for from 4 to 12 persons. There are also two small private dining saloons seating 12 persons each. Below on the lower deck is an auxiliary dining-room seating 36, and two more private dining-rooms seating 12. Forward on the same deck is a smoking-room accommodating 52 people. The machinery consists of a triple-expansion engine with cylinders placed diagonally. The piston valves are operated by Walschaert gear. The power is about 3,000 i.h.p. at 52 r.p.m.

#### FERRY BOATS.

The *Royal Iris II*, built by Harland & Wolff at Govan for the Wallasey—Liverpool ferry service, perpetuates in name a vessel which gained honours at Zeebrugge. She embodies several features which mark a distinct advance upon standard ferry practice, particularly in the provision of a higher degree of comfort in the furnishings and



UNITED STATES LINES' MANHATTAN.  
(Builders, New York Shipbuilding Company, Camden, N.J.)



the inclusion of a sun deck. There are three passenger decks instead of the two usually found on this service. In the saloons, which accommodate about 2,000 passengers, spring upholstered seats covered with antique hide replace the ordinary ferry-boat wood seating. To facilitate manœuvring the Flettner twin rudder has been adopted. The main propelling machinery consists of two sets of three-crank triple-expansion engines, taking steam from three cylindrical boilers at a pressure of 200 lb.

Canadians are naturally proud of the ice-breaking train ferry Charlottetown as indicating the resources of their shipyards. She is employed on the Cape Tormentine—Port Borden service of the Canadian National Railways, between the mainland and Prince Edward Island. Her length is 310 ft., beam 59 ft., draught 19 ft. 3 in., and displacement at this draught 6,136 tons. The railway cars are carried on the main deck, being shunted over the stern of the vessel. Four staircases lead from the main deck to the upper decks, so that the train passengers may proceed from the coaches to the accommodation. Motor cars, of which forty are carried on a special automobile deck, approach along a runway and over a hinged gangway directly on to the vessel. They are berthed immediately over the railway car space, which is two decks in height, and they can be driven all round the boundary of this deck, the main passenger saloons forming an oval-shaped island in the centre. The motorist, with his passengers, after bringing the car to rest, steps out on a raised sidewalk running round the central saloons, from which access to the accommodation is obtained through double doors forming an air lock to isolate the saloons from the effects of wind and cold. The passenger accommodation comprises lounge, ladies' drawing-room and rest-room, with smoking-room and observation saloons on the boat deck above. The propelling machinery consists of three sets of triple-expansion engines developing a total of 8,000 i.h.p. at 118 r.p.m. The forward engine drives the bow propeller which, when working in ice, acts as a centrifugal pump, tending to agitate the water under the ice and so allow the crushing action of the bow to exert its maximum effect. A removable distance piece inserted between the crankshaft and the thrust coupling enables the forward shafting to be uncoupled should it be desired not to operate the forward engine. The two after engines operate as in ordinary twin-screw practice, driving the two stern propellers. On the trials with a displacement of 5,070 tons a mean speed of 15·32 knots was obtained.

A Diesel-electric ferry, the *Prinses Juliana*, went on the Flushing—Breskens service in February. Built by the Rotterdam Dry Dock Company, she is 213 ft. long with a beam of 40 ft. In addition to accommodation for 3,200 passengers she has space on the main deck for sixty motor cars. A Sulzer-Werkspoor airless-injection engine is coupled to two separate dynamos rated at 1,540 amps at 440 volts. There is full pilot house control.

A.M.I.N.A.

## CHAPTER XVII.

### THE DETERIORATION OF SHIPS.

WIDE differences exist in the effective lives of ships. Some prominence was given recently to a remarkable case of longevity. The iron steam collier *John Bowes*, launched by Palmers Shipbuilding and Iron Company of Jarrow in June, 1852, is noteworthy not only as being the first vessel of her type but also as being so well built that she is still in active service under the Spanish flag. A few vessels are still actively employed after 50 years of service, but, fortunately for an industry which largely depends on replacements for its existence, these cases are comparatively rare.

Largely in the light of experience, owners look for an effective life for their ships of between 20 and 30 years. An interesting comment on this point was made during the discussion on the Hon. L. H. Cripp's paper, "Some Considerations on the Economics of Cargo Liners," read to the Institution of Naval Architects in 1930. In it reference was made to a group of three vessels of the "*Keemun*" class (Holt liners), still in commission with—at that time—an average service of 28 years. Commenting on this fact, Mr. John Buchanan stated that a working life of 30 years is quite a moderate estimate for a well-built ship, and he remarked that here is to be found one of the causes of the depression in shipbuilding, that ships are lasting much longer than was expected.

On the anticipation that 25 years of service will be obtained owners make allowance for depreciation towards replacement at the end of that period. The factors which enter into conflict with such methodical procedure are threefold:—(1) The twin sciences of shipbuilding and engineering may advance so rapidly that vessels may be rendered obsolete before their time; (2) through unforeseen circumstances excessive corrosion may set in and shorten the life of a vessel; and (3) owners may not be able to set aside the required amount for depreciation, through depression in trade, and thus their ships may be run beyond their normal useful period.

With regard to the first of these factors the opinion has been expressed that by reason of the construction of ships of specially good design, with machinery of great efficiency, a standard is being set which is much higher than is attained by vessels built a decade ago. It has been said that the advent of the famous *Duchesses* on the Canadian service rendered obsolete certain vessels of less speed and inferior passenger arrangements which had normally several years of service to perform. To the owners of the latter vessels the course is open to have vessels of a better type built, more suited to

the requirements of the particular trade, but while this course may be apparent the wherewithal may not be available.

In the construction of cargo vessels a decided advance has been made during the past few years. According to Mr. Baker, of the National Tank at Teddington, forms which a short time ago would have been accepted as of real merit are now being improved by about 10 per cent. Allied to this the attention which is being given to the after ends of ships with special reference to apertures, posts and rudders, is bringing about certain definite savings. Further, progress in marine engineering at least keeps pace with the advances in ship design, thus combining to produce types which are real "economy" ships.

The second factor which may render ships obsolete before their normal span is corrosion. Certain vessels, though built to the highest standards by builders of repute, have, through circumstances entirely unlooked for and meantime partly obscure, been subject to excessive corrosion. This experience has been fairly common in recent years, and has formed the subject of exhaustive inquiry on both sides of the Atlantic.

Thirdly, in consequence of the prolonged depression in shipping, owners have not been able to lay aside moneys for replacement, and this may have an effect on the service lives of ships. It is difficult to forecast what will be the result of the long depression on future construction. On the one hand, the lack of funds must tell against a demand for new tonnage; on the other, it is certain that rapid deterioration must be taking place in the vessels now laid up. Comparatively few will be able to compete with modern tonnage when normal trading conditions return.

#### THE FIGHT AGAINST NATURAL FORCES.

Immediately the construction of a ship is begun deterioration sets in, and only by careful observation and the application of preservatives can a successful war be waged against the destroying forces at work. It would appear from much that has been written about corrosion that the initial stages of its action may be in operation before a vessel leaves the builders' hands. Subsequently the progress of deterioration depends on the quality of the material incorporated in the ship's structure and on the degree of care exercised by officers and men in respect of cleanliness of ship and by overseers in noting every sign of decay and applying the required remedies.

Although the material used may have been approved by the registration societies, unforeseen troubles may arise which cause much worry and expense. Two recent papers have called attention to instances of excessive corrosion which have developed in vessels on both sides of the Atlantic—Mr. W. Bennett's paper on "Corrosion," read before the American Society of Naval Architects and Marine Engineers in 1930, and that on "Corrosion in Hulls of Merchant Vessels," by Dr. Montgomerie and Mr. Lewis, to the Institution of Engineers and Shipbuilders in Scotland. From them the following illustrations are gathered :—

An oil tanker of about 10,000 gross tons, built in 1918, came on dry dock in 1925. Approximately 113,000 steel rivets were cut out and renewed, and, in addition, about 2,000 were recaulked. The vessel had been dry-docked nine months previously. Several shell plates were renewed on account of wasted butts and seams. The vessel had been trading to shoal water ports, and it was stated that she had not been dry-docked for cleaning or recoating for more than a year after the completion of her construction.

A freighter of about 6,000 tons, built in 1920, came in dry dock in 1925. Approximately 108,000 rivets were renewed in the landing edges of the keel plates, and the bottom plating generally. Nearly all of these rivets were renewed because of general wastage and corrosion. One year had elapsed since the previous dry-docking. The bottom appeared bare of paint and slight pitting was observed generally over the bottom and sides. It was stated that she had not been dry-docked for recoating of the bottom for a period of eighteen months after she was built.

An oil tanker, built in 1917, was dry-docked in 1924. Approximately 103,000 rivets (nearly all the bottom shell rivets) were renewed. Eight months had elapsed since the previous dry-docking.

Shortly after the War several fishing vessels were completed by one builder in the same shipyard and fitted out in the same river. All were ultimately engaged in the fishing industry under practically similar conditions. Within a few months after their completion, two of these vessels had to have a large part of their shell plating renewed. Analyses were made of the steel plates, the rivets, the paint, and the rust, with negative results. No cause could be found to account for the rapid corrosion experienced in the two vessels.

A cross-channel steamer was examined in dry dock three months after completion, and the shell plating was found to be in good condition. After the summer service she was laid up for the winter, and when she was dry-docked in the following spring practically the whole of the bottom shell plating was found to be affected to such an extent that several plates had to be renewed, and a large number specially cleaned and coated.

Special reference is made by Dr. Montgomerie and Mr. Lewis to the internal corrosion of tankers. A large number of these ships have been examined, and although the individual characteristics of corrosion are surprising in their variety they fall into two predominating groups. In the case of tankers carrying animal, vegetable, or the heavier mineral oils, the corrosion which occurs is confined to the surface of bottom plating where it develops in the form of irregular pits and grooves. In tankers transporting the lighter petroleum distillates, while such pitting and grooving in the bottoms occur, the predominant wastage takes place in the upper portions of the tanks, that is, the decks forming the top of the tanks, the expansion trunks, and the members that project into the oil space.

As an example of the first group the case is cited of a vessel built in 1921 and surveyed in 1930. It was then found that the bottom plating was corroded locally, particularly in the neighbourhood of the riveted seams, and that the original thickness of 0.62 in. had been reduced to 0.25 in. An example of the second is the case of a similar vessel built for the same owners at about the same time, in which the corrosion was of an entirely different nature. In the first case the corrosion was severe but local; in the second it was equally severe but general in character, and at the end of a similar period of service the plating in the expansion trunks was found to be holed in places and the internal steelwork of the vessel so wasted as to require extensive renewal.

Broadly speaking, it appears that American ships suffer more from wasted rivet points than from pitting of plates; the reverse is the case in many British oil tankers. The possible explanation put forward by Mr. Bennett is that in American tankers steel rivets are used, and these have frequently been found to be electro-positive to

the plates (thus causing wastage of the rivets), whereas in British tankers iron rivets are used which are usually electro-negative to the plates (thus tending to cause corrosion or accelerated pitting of the plates).

Such being the case—and the cases cited seem to bear out the general accuracy of this explanation—it appears as if the cure for such excessive corrosion as has been experienced lies in discovering the proper rivet “content.” It is well known that iron ships with iron rivets were much less subject to corrosion than are steel vessels. The chief apparent difference between iron and steel rivets is the presence of slag in the former and its absence in the latter. As much as 0·5 per cent. to 0·9 per cent. of slag is found in iron, whereas in steel slag is practically absent. In the manufacture of steel the whole process is largely mechanical, whereas in the puddling process a great amount of hard manual labour is required. In the case of iron each crystal is said to be surrounded by an envelope of slag and the successive rolling operations elongate the crystals (enclosed in a matrix of slag), thus giving iron its fibrous structure. It is claimed that the anti-corrosive property of iron is due partly to this protective coating of slag round the fibre, together with the fibrous regularity of the structure.

During the discussions on these papers the necessity for removing scale from plates before painting was emphasised. Dr. McCance has expressed the opinion that the shorter time now customary between the delivery of plates to the shipyard and their being built into the hull has had a pronounced influence in increasing the number of cases of corrosion afterwards, because of the lack of opportunity to remove the mill scale by weathering. In at least four cases examined by him the corrosion had been due to shedding of the mill scale and consequently of the paint, the unprotected surface of the steel being thus left open to attack by the water.

In ordinary cases of corrosion it appears that careful scraping, cleaning and painting of the hull arrest its progress, and this fact points to the necessity of having vessels dry-docked within a few months after they have gone on service, in order to observe the condition of the shell and take steps to apply preservatives should such be found necessary. When the interaction between rivets and plating has been properly studied excessive corrosion through electrolytic action will be overcome.

Apart from the drastic cases mentioned above, ships in general are subjected to the effects of corrosion in a minor degree. For example, the plating at “wind and water” requires frequent scaling and preservative treatment. Further, it is noticed that considerable “scouring” takes place in the locality of sewage or other discharges. Scouring is always evident at circulator outlets, outer plating in way of shaft bossings, sternposts, rudders, and particularly bilge keels. In practically all cases a definite stream line can be detected. With the exception of the bilge keels it is comparatively easy to arrest the erosion of plating, but bilge keels, especially the built-up type, are an endless source of trouble through erosion in the bosom of the angle bars with consequent slackening of the rivets.



Variations in temperature appear to play an important part in the corrosion of the shell plating below the water-line, and it is an easy matter to identify that portion of the bottom plating which forms part of reserve feed tanks. An endless fight is waged against these corroding influences; the affected parts are thoroughly "sliced" and scaled, and the whole treated with anti-corrosive and anti-fouling compositions. Heavy dock charges limit length of time in dry dock, and this fact tells against effective protection being afforded. Paint manufacturers generally stipulate a minimum of five hours for the drying of the first coat of paint and seven days before the application of the second, but seldom, if ever, are such opportunities afforded to give the preservatives their proper chance.

#### EROSION OF PROPELLERS.

A subject of pressing interest to shipowners and shipbuilders is that of the erosion of propeller blades. While it does not affect the useful life of ships it may be a most serious item in upkeep costs.

In 1919 the late Sir Charles Parsons and Mr. Stanley Cook read, conjointly before the Institution of Naval Architects, a paper dealing with "Investigations into the Causes of Corrosion or Erosion of Propellers." During the discussion Mr. A. T. Quelch said that this matter came into serious consideration first in the Tribal class of destroyers and afterwards in the large propellers of the *Lusitania* and *Mauretania*. In the latter ships the erosion extended to a depth of two or three inches in a very short time. It took place so rapidly that unless some cure were effected the blades would have to be replaced two or three times in a season. Such an outlay could not be borne with equanimity, even by the largest shipping companies. While the science of propeller design has advanced somewhat since these famous Cunarders were built, it is doubtful whether even the best makers of propellers will guarantee complete immunity from the action of erosion, for, in the nature of things, it is difficult to see how cavitation can be obviated in high-speed ships of great power, and where cavitation exists erosion is to be feared.

In the paper referred to above the theory put forward was that erosion was caused by the collapse of vortex cavities. The calculations showed that when a spherical vortex cavity in the sea closes upon a central nucleus the instantaneous pressure or blow upon this nucleus may reach from 68 tons to 765 tons per sq. in., depending on the diameters of the original cavity and of the nucleus. Imagine, then, metal being subjected to such impingements: it can readily be seen that erosion is bound to follow.

The cure, then, lies in the elimination of all influences tending to produce these cavities, but it is doubtful whether all of them can be eliminated. Principally cavitation is created by the rupture of the column of water with which a screw is fed. The function of a propeller is to accelerate a body of water, the reaction on the blades giving ahead motion to the ship. If the conditions under which a screw is operating are such that the water cannot flow with sufficient speed to feed the screw without rupture, then cavitation follows.

The factors which determine the limiting speed are the immersion of the screw and the atmospheric head.

In the case of the *Daring*, the trials of which first drew attention in this country to the malign influence of cavitation on the performances of ships, the cure for the evil was found in giving greater surface to the propellers, and subsequently in the cruisers of the Drake class a like remedy was applied.

Recently some articles on this problem by Mr. Baker have appeared in the *Engineer*; the practical application of the theories therein put forward resolves itself into questions of amount of surface and limitation of pressure. With increase in the speed of ships and the conditions set by revolutions and power, it is found that the pressure limits to which designers are perforce driven are greatly in excess of those appropriate to vessels of lower speeds. That is, in the latter ships it may be possible to have screws admirably suited for their purpose which will have actual pressures of only 2 lb. or 3 lb. per sq. in. of projected surface, whereas in ships of faster type with high revolutions (and correspondingly small screws) and great power the pressures required may be 12 lb. or 13 lb., or even greater. In order therefore to assign the surface required to obviate cavitation it is necessary to collect data relating to the performances of ships of all types, at the same time recording whether the propellers, whose records are thus related, showed signs of erosion. It is not always possible to discover whether such is the case, for many months usually elapse between trials and subsequent dry-docking.

Pressure limitations do not provide absolute standards for the prevention of cavitation, and it is now realised that shapes of blades in respect of the curvature of the face and back of both the leading and trailing edges may have a decided influence on erosion. In this connection the work being done in the special tanks for screw experiments should ultimately afford most valuable and practical guidance. In such tanks it is possible to reproduce corresponding conditions to those in which full-sized propellers operate. Further, the inception and subsequent progress of cavitation can be observed and photographed, besides recording the drastic effects on thrust and torques when cavitation becomes really serious.

Although rupture in the thrust column is the primary cause of cavitation, and consequently of erosion, the presence of bossings, struts, and any obstructions which may interfere with the steady flow of the water into the screws causes disturbances which induce the formation of cavities. It is important therefore to afford wide clearances from hulls and from ends of bossings or struts.

#### GENERAL DETERIORATION.

Reference has been made to the exceptional cases of rapid corrosion which have formed the subject of special investigations, and to the erosion of propellers which is a matter of vital importance in large and fast ships, but in the majority of vessels neither of these gives cause for alarm or affects their useful lives. Nevertheless, few ships escape the necessity of having periodic overhauls which may be

expensive, or otherwise, depending largely on the care exercised in observing early signs of deterioration.

It has been found that spaces surrounding steam deck machinery are liable to rapid corrosion. In one large liner, which has capstan engines housed below the poop deck, the surrounding spaces are always in a damp and heated condition. Although natural exhaust trunks are fitted the escaping steam creates an atmosphere which is most destructive.

Main vent trunks, boiler escapes, calorifier spaces and galley spaces are all very liable to be the seat of rapid corrosion, as also is the tank top plating under boilers. In coal-burning ships the bunker sides and deck plating in way of 'tween deck bunkers are subject to rapid decay, but this can be obviated to some extent by efficient ventilation and the application of bituminous enamel.

It is said that magnesite compositions may be responsible for the corrosion of decks, but this depends largely on the material used and the manner in which it is mixed and laid.

In the ordinary wear and tear of service a large percentage of the cost of upkeep and renewals may be laid to the charge of the passengers and crew. The former are largely responsible for the choking of soil pipes. The latter seek methods of securing immediate results without considering the consequences; an example is the not uncommon practice of tightening sidelight butterfly nuts with crowbars, with the result of broken nuts, stripped threads, and broken glasses.

On the machinery side the cost of renewals must vary with the type installed. It is known that the original boilers in some of the old Clyde paddle steamers of many years' service have had to be replaced. Even in modern steam plant periodic renewals must be reckoned upon. Mr. J. Johnson, in his 1929 paper to the Institution of Naval Architects on the "Propulsion of Ships by Modern Steam Machinery," stated that the sum of £200 per voyage amply covers the running repairs in the Duchess of Bedford's installation, and he gave the major charges which conceivably may have to be faced in an installation of this kind (allowing the vessel a life of 25 years and taking an ultra-cautious view of possible replacements) as:—

Renewal of condenser tubes every seven years . . . . .	£7,000
Renewal of superheater tubes every seven years. . . . .	3,600
Renewal of air-heater tubes every seven years . . . . .	2,400
Renewal of boiler fire row tubes every seven years . . . . .	3,300
	<hr/>
	£16,300

or, say, £50,000 in 25 years. It must be noted that these renewals are concerned entirely with the boilers and condensers; the engines are presumed to remain in good running order, save for minor repairs, during the vessel's life. In the case of double-reduction geared turbine ships a great deal of expense has been incurred in the renewal of gear wheels.

In oil-engined vessels the main source of trouble lies with cylinder liners, but its extent varies greatly with type of engine.

On the whole, it may be said that the deterioration of ships is

governed more by advance in ideas concerning modern requirements than by actual decay. Few passenger ships of pre-War days have the type of accommodation now considered necessary for the comfort of passengers, and still fewer have the equipment associated with modern ideas of life-saving.

If an old ship be examined it will be found that in all probability first-class passengers are accommodated in four-berth staterooms ; nowadays single-berth rooms are what are most in demand. In old ships running water, cold only, may or may not be led to each cabin ; in modern ships hot and cold water must be afforded. That there should be a private bathroom attached to each cabin was an arrangement undreamt of a few years ago, but it is now becoming almost essential. While the woodwork in the cabins and in the public rooms of old ships is generally in a remarkably good state of preservation, there is a lack of the spaciousness and brightness characteristic of modern ships. The standard of ventilation is also far behind that now afforded, and means of ensuring a comfortable yet not "stuffy" interior are not available.

When boat accommodation for all was required ships which were already on service were provided with equipments which met the regulations in conjunction with the davit gear previously fitted, but for the most part these equipments would be ineffective if any serious call were made on their services. Modern davit and boat equipments are infinitely superior to those common in pre-War days. Notably, also, pre-War liners cannot compare with modern ships in respect of economy in fuel, their weights of machinery in relation to the power developed being also much greater.

It is doubtful whether the points which have been indicated as rendering passenger ships obsolete before they have deteriorated structurally apply with equal force to cargo ships. When tramp steamers with reciprocating machinery and Scotch boilers are still being built, it is obvious that this type has a useful function to fulfil. When no undue corrosion sets in, and reasonable care is taken in the general upkeep, the serviceable and possibly profitable life of a tramp may be 30 years or even more. The advent of fast cargo ships with speeds of 15 knots and over may point to a demand for the transport of freight at higher speeds than the ordinary tramp can attain, but such speeds can only be given in return for freight rates higher than those at which the 9- to 10-knot vessel can successfully operate.

There are available several types of preservatives which prevent corrosion, and also fouling to a lesser degree, and the effective lives of ships can be extended by frequent dockings and the application of such preservatives.

Experience has shown, then, that the structure of ships, in general, outlasts their real usefulness ; that is, development in type is a larger factor in rendering ships obsolete than structural decay. Perhaps in this fact lies the real hope of any revival in shipbuilding, for with a return to normal passenger trading conditions the owners who can offer the most attractive accommodation will find their vessels profitably employed.

CONSTRUCTOR.

## CHAPTER XVIII.

### MARINE AVIATION.

THE history of the formation and development of the Fleet Air Arm having been dealt with at considerable length in the "Annual" for 1931, by "Phoenix," it will be unnecessary to cover the same ground again this year, and may be of greater interest to give a brief summary of the present Fleet Air Arm equipment, pointing out the classes of aircraft which are in the process of, or due for, replacement.

By far the greatest portion of the Navy's flying *matériel* is used for service in aircraft carriers, although a number of cruisers are equipped with aircraft launched by catapult. With few exceptions the aircraft used by the Fleet Air Arm are of the land-plane type, while the seagoing flying boat squadrons are administered by the Coastal Area, their personnel being composed entirely of Royal Air Force officers and men.

That section of the Fleet Air Arm which operates from aircraft carriers comprises a total of 27 Flights, of which 9 are Fleet Fighter Flights, 11 Fleet Spotter Reconnaissance Flights, and 7 Fleet Torpedo Bomber Flights.

*Fleet Fighter Flights.*—H.M.S. Furious is the home of No. 401 Fleet Fighter Flight, which is equipped with Fairey "Flycatcher" aircraft. No. 403 Fleet Fighter Flight, with the same type of aircraft, is at present in the Far East in H.M.S. Hermes. H.M.S. Courageous carries Nos. 402 and 404 Fleet Fighter Flights, and H.M.S. Glorious Nos. 405, 408 and 409 Fleet Fighter Flights. Two Flights, Nos. 406 and 407, are at present stationed ashore.

The re-equipment of the Fleet Fighter Flights of the Fleet Air Arm is at present proceeding, the two new types selected being the Hawker "Nimrod" (Rolls-Royce "Kestrel" engine) single-seater fighter, and the Hawker "Osprey" (also Rolls-Royce "Kestrel") two-seater Fleet Fighter Reconnaissance machine. The latter represents an innovation in class as far as the Fleet Air Arm is concerned, the Fleet Fighter Flights having hitherto been equipped with single-seaters only.

The "Nimrod" and the "Osprey" have at present been issued to Nos. 404 and 409 Fleet Fighter Flights. In addition, Nos. 402 and 408 Flights have received the "Nimrod," and No. 407 Flight is now being equipped with "Osprey" float-planes for catapult work. In the Spotter Reconnaissance and Torpedo Bomber classes, re-equipment has not yet been decided upon. The "Nimrod" is a development of the Hawker "Fury" interceptor fighter, while the "Osprey," although greatly resembling the Hawker "Hart," is regarded as a distinct type. It is of interest to record that in the "Osprey" a structural innovation is being introduced in that a certain number of those ordered will have fuselages made for the

first time of rustless steel tubing. The manufacture and use of this material is as yet in an early stage, and the use of it in the "Ospreys" is to be regarded, for the present, as an experiment. Aircraft operating over the sea are even more subject to the ill-effects of rust than are land-planes, which rarely spend long periods over or near the sea, and everything which can be done to slow down the rate of corrosion is of the utmost importance in all marine aircraft. Rustless steel in sheet form has by now been fairly well tried out, and several specifications exist which combine the requisite degree of strength and ductility with a sufficient resistance to corrosion. No ferrous material known is absolutely rust-proof, but many have such a slow rate of corrosion that for practical purposes they may be regarded as rustless.

*Fleet Spotter Reconnaissance Flights.*—The standard type of aircraft of this class is the Fairey III F. with Napier "Lion XI" engine. Following is a list of the Flights, the name in parentheses after the number of the squadron being the aircraft carrier in which the particular Flight is carried:—440 (Hermes); 441 (Glorious); 442 (Furious); 443 (Lee-on-Solent); 444 (Lee-on-Solent); 445 (Courageous); 446 (Courageous); 447 (Glorious); 448 (Glorious); 449 (Furious); 450 (Courageous).

*Fleet Torpedo Bomber Flights.*—All the aircraft in this class are of Blackburn design and construction, and fitted with Napier "Lion" engines. The list of Flights, the aircraft carriers in which they are carried, and the machines with which they are equipped, are as follows:—No. 460 (Glorious) Ripon; No. 461 (Glorious) Ripon; No. 462 (Glorious) Ripon; No. 463 (Courageous) Dart; No. 464 (Courageous) Dart; No. 465 (Furious) Ripon; No. 466 (Furious) Ripon.

#### COAST DEFENCE.

The Royal Air Force squadrons equipped with marine aircraft, i.e. the flying boat squadrons, remain seven in number, and none has been re-equipped during the past year. In point of fact, one (No. 202) has not even got flying boats yet, but is temporarily using Fairey III F. float-planes. Experimental flying boats have been built, such as the Short "Singapore II," the Saunders-Roe "Severn," the Supermarine "Southampton X," and the Blackburn "Sydney," but so far no decision has been reached concerning the type to be chosen for replacing existing types.

Of the seven flying boat squadrons, four (Nos. 201, 204, 205, and 210) are equipped with the Supermarine "Southampton." No. 203 has the Short "Rangoon," and No. 209 the Blackburn "Iris," while as already mentioned No. 202 is at present using float-planes.

An extremely interesting flying boat was produced during the year by Messrs. Short Brothers, of Rochester. Known as the R.6/28 type, this machine is by far the largest British flying boat ever built, and although performance figures may not be quoted it can be said that it is one of the fastest, if not actually the fastest, large flying boat in the world. It has an overall length of 89 ft. 6 in., a height of 30 ft. 4 in., and a wing span of 120 ft. The total loaded weight of

the machine is 70,000 lb. (more than 30 tons), and the power plant consists of six Rolls-Royce " Buzzard " water-cooled engines giving a maximum total power of 5,580 b.h.p. The maximum power is developed at an engine speed of 2,300 r.p.m. at sea level. The normal power of the engines is 820 b.h.p. each at 2,000 r.p.m. at sea level.

Stainless steel has been used extensively in the hull construction of the Short R.6/28, and if this material realises the makers' expectations, a very great step will have been made with the construction of this flying boat towards the large marine aircraft which can spend the whole of its life, when not flying, actually on the water. The advantages of this would be enormous, as the beaching of a large flying boat is necessarily a somewhat cumbersome operation, during which there is always a risk of some damage being done to the fairly delicate hull. If the machine could spend its non-flying hours at moorings without trouble from corrosion, a great deal of manhandling would be saved and minor local damage avoided.

The Short R.6/28 is intended for long-range bombing and reconnaissance, and its production and successful completion, followed by test flights which were in every way satisfactory, must be regarded as the greatest aeronautical British achievement of 1932.

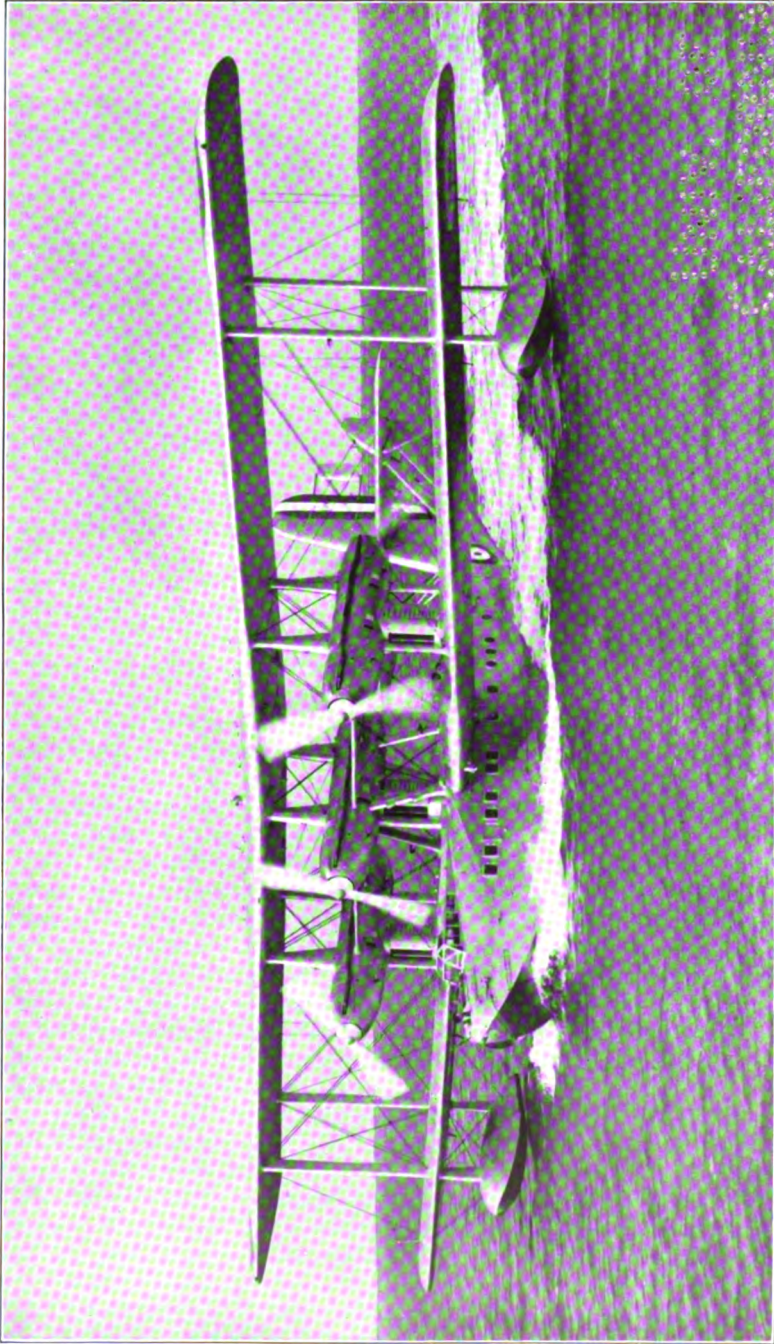
In the general design of the Short six-engined flying boat the long experience of the firm in the production of flying boats is utilised to the full, and the hull form can trace its ancestry to previous successful Short boats. The engine arrangement is generally similar to that first used in the " Singapore II," in which two pairs of engines were placed in tandem, projecting fore and aft from single struts. In the R.6/28 there are three of these engine pairs, but in spite of this the frontal area and consequent air resistance are kept to very low figures, thus accounting in part for the excellent performance.

#### CIVIL MARINE AVIATION.

In last year's " Annual " reference was made to the new four-engined flying boat which Messrs. Short Brothers were then building for Imperial Airways. Originally the type was described as the four-engined " Calcutta," but later it became known as the " Kent " class. Still more recently the appellation was changed to " Scipio " class, from the name of the first of the series. The " Scipio " class of flying boat has now been in service on the Mediterranean section of Imperial Airways' route from London to Cairo for a considerable time, and has there supplanted the Short " Calcuttas " previously operated over the Mediterranean. The " Calcuttas " have been transferred to the Nile—Great Lakes section of the Cairo—Capetown route. The " Scipio " class has proved entirely successful, and it is worth placing on record the rather exceptional fact that from its first test flight to its definite adoption by Imperial Airways Limited, not a single important modification to the original machine was necessary. Few large aircraft have equalled this record, and the fact speaks extremely well for Messrs. Short Brothers' skill.

From the passengers' point of view the " Scipio " class has proved popular, first because of the relative absence of noise in the cabin, and second on account of its spaciousness, which equals that of a





SHORT R. 6/28 MILITARY FLYING BOAT.  
(Builders, Messrs, Short Brothers, Rochester.)  
(By courtesy of "Flight.")





Pullman railway car, but has not hitherto been found in aircraft of the heavier-than-air-type.

The "Scipio" is a four-engined flying boat of generally similar lines to the older "Calcutta" and previous Short flying boats, but differing from them in many details other than dimensions. The all-metal hull is built mainly of duralumin, anodically treated to resist corrosion, but the underwater portion of the hull, i.e. from the chine to the keel, is planked with stainless steel. This has proved entirely successful, and thus, with the "Scipio" class and the large military R.6/28 previously referred to, the day of the large flying boat planked entirely, as to hull, with rust-proof metal has been brought appreciably nearer.

In connection with the stainless steel planking of the submerged part of the hull of the "Scipio" class an interesting phenomenon came to light. The outboard wing tip floats used to give the machine lateral stability on the water (the centre of gravity being situated so high in a flying boat as to preclude natural stability from the hull alone) were, and are, made of duralumin, as planking them with stainless steel would have entailed a considerable increase in weight. When the first machine had been at moorings in the Mediterranean for a few weeks, it was discovered that the wing tip floats were suffering severely from corrosion. Galvanic action appeared to have been the cause, and tests disclosed the fact that an appreciable potential existed when the stainless hull and the duralumin wing tip floats were made the "plates" of a battery circuit. The cure was one which has been used successfully in surface vessels. A piece of zinc was attached to the heel of each wing tip float. The electrolytic action attacked the zinc and left the duralumin float alone. When the zinc has been nearly eaten up it is renewed, and since this remedy has been adopted the duralumin floats have suffered no ill effects from corrosion.

The biplane wings of the "Scipio" class have a primary structure of duralumin, with corrugated strip spars and tubular ribs. The wing covering is fabric, which is light, cheap, easily removed for inspection of the internal structure, and cheap to replace.

Four Bristol "Jupiter" engines, type XF.BM., developing a maximum of 600 b.h.p. each at 2,200 r.p.m. at 5,000 ft. altitude, are placed abreast in the gap between the wings. This arrangement of the engines makes for simple installation and good accessibility, but offers probably greater air resistance than would the same number of engines placed in two tandem nacelles. The uncertainty of the cooling of the rear engine is, however, avoided, and the yawing moment set up when one of the outer engines stops can be taken care of by the rudder, the increase in drag probably being no greater than the loss in airscrew thrust which results when the front engine of a tandem pair stops and the airscrew of the rear engine then has to work at too great a pitch.

A great deal of thought has been given to the lay-out of the internal accommodation of the hull. In the extreme bow is a mooring compartment provided with a hatch. A gangway between the pilots' seats leads to it from the cockpit. Side-by-side seating is

adopted, and the cockpit is entirely covered in so as to protect the pilots from wind and rain. Behind the pilots is accommodation for the wireless operator, and immediately aft of his position is a large mail compartment holding approximately two tons of mails.

In the cabin itself there is seating and table accommodation for 15 passengers, and ample space is afforded everywhere, so that there is none of that cramped feeling to which air travellers have hitherto been accustomed. Large windows give light in the cabin, and a well-planned ventilation system ensures that the cabin never gets stuffy. The walls of the cabin are lagged with sound-absorbing material, and so effective has this proved that it is possible to converse in quite an ordinary tone of voice when the machine is flying at cruising speed.

The seats are of the special Short type, in which cushions and back rests are inflated with air. In case of emergency, these cushions can be slipped off the chair frameworks and used as very effective life-saving appliances.

For a tare weight, fully equipped, of 20,460 lb., the "Scipio" class has a permissible gross weight of 32,000 lb., giving a disposable load of 11,540 lb. As normally operated, the machine carries fuel for a cruising range of 450 miles, when the weight of pay load plus crew is 8,120 lb., or 3.38 lb. per h.p. based on maximum power.

When loaded to capacity the "Scipio" has a maximum speed of 137 miles an hour, and when the engines are throttled to cruising revolutions, the cruising speed is 105 miles an hour at a height of 5,000 ft. In case of one engine failing, the machine is able to continue its flight on the remaining three engines.

An interesting project referred to in last year's "Annual" had to be abandoned during the year for economic reasons. The large six-engined monoplane flying boat designed by the Supermarine Aviation Works of Southampton was to have been the most ambitious civil flying boat ever attempted by a British firm, but when the hull was well on the way, the Air Ministry stopped further work, and ultimately cancelled the order. This decision is greatly to be regretted, as the Supermarine machine would have provided some very interesting data, especially when compared with the Short R.6/28 military flying boat. The Short is a biplane, and the Supermarine was to have been a monoplane. The two machines would have been of approximately the same gross weight, and would have been fitted with the same engines. However, the financial situation made economies imperative, and the decision to sacrifice the civil rather than the military flying boat was, perhaps, on the whole a wise one, the more so as Imperial Airways had no immediate practical use for the very large machine. From a broader point of view, however, the abandoning of the project is to be regretted, as sea routes other than the Mediterranean will obviously have to be operated by civil British flying boats some day.

Except for the Short "Scipio" class, no new civil flying boat was produced by a British firm during 1932. The Saunders-Roe boats of the "Cutty Sark," "Windhover," and "Cloud" type referred to in last year's "Annual" continued to do good work.

THE EDITOR OF "FLIGHT."

# NAVAL REFERENCE SECTION.



## STATEMENT TO ACCOMPANY NAVY ESTIMATES, 1932.

THE net total of the Navy Estimates for 1932 is £50,476,300, which is £1,128,700 less than the net total of the 1931 Estimates.

This total of £50,476,300 has been fixed with strict reference to the needs of the financial situation, and must not be regarded as an adequate provision for the needs of the Navy. On the contrary, I am satisfied that on the basis of considering actual requirements, not even the most rigid scrutiny could have justified the restriction of Navy Estimates to such a figure. Under the scheme, however, for the reduction of National expenditure laid before Parliament last September, £50,476,300 is the sum which remains available for Naval services in 1932, and the Estimates which I am presenting indicate what, in the judgment of the Board of Admiralty, is the most advantageous way of distributing it amongst those services.

It will probably be convenient if I explain in what way the total of £50,476,300 has been arrived at.

The net total of the Navy Estimates for 1931 was £51,605,000. That total, however, as was explained in the First Lord's printed Statement of last year, included an abnormally low figure for New Construction, as a result of the curtailment of the 1928 and 1929 programmes. Accordingly, the Committee on National Expenditure in their forecast of future expenditure made allowance—on the basis that existing Naval policy remained unaltered—for an increase of £2,700,000 in 1932, to provide for the normal upward curve of expenditure on the 1930 and 1931 New Construction Programme already approved by Parliament. As against this increase of £2,700,000, the Committee on National Expenditure recommended reductions in pay and pensions and other administrative economies, which, it was estimated, should effect altogether in 1932 a saving of £1,828,700, and it was further announced in the "Memorandum on the Measures to secure Reductions in National Expenditure" presented to Parliament in September last (Command Paper 3952, p. 4) that, in addition, "the Service Departments will secure savings on other than pay and pensions to the amount of approximately £5,000,000," of which additional savings the Navy's share was fixed at £2,000,000. These two reductions, of £1,828,700 and £2,000,000 respectively, set off against the increase of £2,700,000, give a net reduction of £1,128,700 as compared with 1931, and bring the total of the 1932 Estimates to £50,476,300.

I propose in introducing the Navy Estimates to explain fully the principal decisions which it has been necessary to take in order to

limit Naval expenditure in 1932. From the nature of these decisions it will, I think, be clear not only that the exceptional demands of the present financial situation have been loyally recognised, but also that it would be impossible to frame future Navy Estimates on the same basis as has been adopted this year without making the most serious inroads into the strength and efficiency of the Fleet.

The New Construction Programme for 1932 is practically a repeat of that approved for 1931. It consists of:—

- Two Cruisers of the "Leander" class ;
- One Cruiser of the "Arethusa" class (5,000–6,000 tons) ;
- One Leader and eight Destroyers ;
- Four Sloops ;
- Three Submarines ;
- One Shallow Draught Gunboat ;
- One Destroyer Depot Ship ;

and small craft (One Boom Defence vessel, one Tug, two Tenders, and three Lighters).

The Destroyer Depot Ship is required to replace H.M.S. Sandhurst, the Depot Ship of the Mediterranean Fleet, which is almost 30 years old and approaching the end of her effective life.

I should mention that, as in previous years, suitable allowance has been made for anticipated under-spending in contract work, etc.

B. EYRES-MONSELL.

ADMIRALTY,

February 23, 1932.

## NOTES ON MATTERS OF GENERAL INTEREST.

### DISTRIBUTION OF THE FLEET.

#### BATTLESHIPS AND BATTLE CRUISERS.

During the past year, the last two ships of the "Iron Duke" Class, the Marlborough and the Iron Duke, have been withdrawn from service in accordance with the provisions of the London Naval Treaty. The Marlborough is being utilised for certain trials, after which she will be scrapped. The Iron Duke has been paid off and is being demilitarised. She will resume her duties as Gunnery Training Ship at Portland, as permitted by the Treaty, towards the end of the year.

The Barham is still under reconstruction in Portsmouth Dockyard and will not be completed before April, 1933, and the Ramillies and the Repulse will pay off during next summer, preparatory to being taken in hand for large repairs during the financial year 1933.

#### AIRCRAFT CARRIERS.

The large repair of the Furious has been completed and she has joined the Courageous in the Atlantic Fleet.

The Glorious (Mediterranean Fleet) was under repair after collision from April to September, 1931.

The Eagle was withdrawn from service in May, 1931, for large repairs which will not be completed before the end of 1932.

The Argus remains in reserve.

#### CRUISERS.

During the past year the Exeter has joined the Second Cruiser Squadron, replacing the Hawkins. Thus the squadron now consists of four ships of the improved "County" Class, carrying 8-inch guns.

## DESTROYERS.

The Eighth Destroyer Flotilla in China, which formerly consisted of the smaller "S" Class Destroyers, has been relieved by a flotilla of larger and more modern vessels. Four of the "S" Class vessels relieved are past further service and will be scrapped in 1932.

## SUBMARINES.

In consequence of the loss of the Poseidon in collision with a Chinese merchant vessel off the coast of Shantung in June, 1931, and of the transfer of the Otway and Oxley from the Royal Australian Navy, a slight readjustment of submarine flotillas has been effected.

The First Submarine Flotilla (in the Mediterranean) now consists of three "O" and three "R" Class.

The Second Submarine Flotilla, consisting of six "L" Class Submarines, with the Depot Ship Lucia, was incorporated during 1931 in the Atlantic Fleet.

The Rainbow, the last submarine of the 1928 programme, which has recently been completed at Chatham, will replace the Poseidon in the Fourth Submarine Flotilla (on the China Station) and will bring this flotilla up to its full strength of twelve modern submarines.

In consequence of the unsuitability, owing to small size and low endurance and speed, of the tenders Adamant and Marazion, attached to the Second and Fourth Flotillas respectively, these vessels are being replaced by the Leaders Stuart and Bruce. The Atlantic and China Flotillas will thereby be brought into line with the Mediterranean Flotilla, which already has the Leader Douglas as tender. The Adamant will be scrapped on relief, and the Marazion in 1933, in view of their age.

The three submarines of the 1929 programme—the Thames, Swordfish, and Sturgeon—will be completed during 1932. The Thames will join the Fifth Submarine Flotilla at Portsmouth; the Swordfish and Sturgeon will relieve submarines of the "H" Class in the Sixth Submarine Flotilla at Portland.

Submarine M. 2, a seaplane carrying vessel, belonging to the Fifth Submarine Flotilla, was lost near Portland on January 26, in circumstances which are still obscure.

## SLOOPS, ETC.

The new sloops Shoreham, Bideford, Fowey, and Rochester (1929 programme) have replaced, or will shortly replace, old sloops abroad.

The sloop Petersfield, tender to the Flagship on the China Station, was wrecked on the China coast early in November, and unfortunately became a total loss.

## RIVER GUNBOATS.

The Falcon completed for service on the Yangtse River on September 30, 1931. The old gunboats Widgeon and Teal have been sold at Shanghai.

## CO-OPERATION WITH THE DOMINIONS.

## COMMONWEALTH OF AUSTRALIA.

The transfer of the submarines Otway and Oxley from the Royal Australian Navy to the Royal Navy has already been referred to. They now form part of the First Submarine Flotilla of the Mediterranean Fleet.

The periodical interchange of ships between the Royal Navy and the Royal Australian Navy, postponed from 1930 for financial reasons, has again been deferred for similar reasons. It is, however, hoped to resume this highly desirable practice as soon as the financial situation permits.

## CANADA.

The destroyers Saguenay and Skeena have been commissioned as part of the Royal Canadian Navy. Canada continues to maintain the two "S" Class destroyers lent from the Royal Navy.

## NEW ZEALAND.

The cruiser Dunedin is now being refitted in the United Kingdom, and will return to New Zealand in the course of the year.

Docking facilities in New Zealand have been increased by the recent acquisition by the Wellington Harbour Board of a Floating Dock capable of accommodating large cruisers.



## FLEET ACTIVITIES ABROAD.

## ATLANTIC FLEET.

H.M. Ships Dorsetshire and Norfolk (Second Cruiser Squadron), under the command of Rear-Admiral E. A. Astley-Rushton, visited Kiel for a week in July, 1931, and received a most cordial reception. The occasion provided one more proof of the value of such visits in establishing and maintaining good relations with Foreign Powers.

## MEDITERRANEAN FLEET.

On the occasion of the revolt of the Portuguese garrison in Madeira in April last, H.M.S. London, which was at Gibraltar on her way home to recommission, proceeded to Funchal to safeguard British lives and interests, and the fact that these were not endangered was largely owing to her presence and the good offices of her Captain. During the last few days of the revolt the London was relieved by the Curlew, which was on her way to the Mediterranean from England.

On the occasion of the riots in Cyprus in October last, the London, flagship of Rear-Admiral J. C. W. Henley, together with the Shropshire and Colombo, and the destroyers Acasta and Achates, were at once despatched from the Mediterranean Fleet, which was at Suda Bay. Each ship, on arrival, took control of a port, landing Seamen and Royal Marines as necessary to support the local police and military forces. Only one serious incident occurred, the Marines of the Colombo being forced on one occasion to open fire upon and disperse a large and hostile mob which had resorted to violence. Quiet having been restored, the ships left on November 6, 1931.

## RED SEA AND PERSIAN GULF.

The usual Anti-Slavery patrols by two sloops have been carried out in the Red Sea without incident. By the presence of these vessels the slave traffic in the Red Sea is very seriously impeded and indeed reduced to almost negligible dimensions. Their withdrawal would undoubtedly result in a large increase in the traffic.

Work in the Persian Gulf in the protection of British interests has been much the same as in recent years. Co-operation with the R.A.F. continues to be maintained.

## AFRICA.

Early in January, 1932, H.M.S. Carlisle visited Tristan da Cunha, this being the first occasion on which a man-of-war has visited the island since 1923.

## AMERICA AND WEST INDIES.

In order to further British interests in South American waters, a South American Sub-division of the American and West Indies Squadron has been re-instituted. This has been placed under the command of a Commodore, flying his broad pennant in H.M.S. Durban.

The Despatch, flying the flag of Vice-Admiral V. H. S. Haggard, and the Danæ were present at Buenos Aires for the opening of the British Empire Trade Exhibition by H.R.H. The Prince of Wales in March, 1931. The aircraft carrier Eagle, accompanied by the destroyer Achates, was also present, and gave some most successful demonstrations of flying. She subsequently visited Rio de Janeiro, where she gave some equally successful demonstrations.

The Danæ and Scarborough rendered valuable service at Belize, British Honduras, after it had been devastated by a hurricane on September 10 last. The Royal Fleet Auxiliary Serbol also assisted by conveying stores and medical supplies.

## CHINA.

The year 1931 showed a marked decrease in bandit activities against British shipping on the Yangtse River, but the terrific floods experienced throughout the Yangtse Valley during the summer months were probably in part the cause of this. The present general state of affairs in China does not promise any permanent cessation of banditry, and the services of our gunboats are still indispensable for the protection of British life and property.

Boats' crews of H.M.S. Hermes performed good service in rescuing, during severe weather, the crew of the Japanese ss. Ryujin Maru, wrecked on Turnaboui Island on November 3, 1931.

Two destroyers of the Eighth Destroyer Flotilla, the Sterling and Sirdar, co-operating with Chinese troops from Swatow, succeeded in rescuing part of the cargo and in capturing some pirates at Namoa Island, after the piratical seizure of ss. Hanyang on November 20.

#### HYDROGRAPHY.

During 1931, H.M. Surveying Ships have been very fully engaged in making new surveys or re-surveys as necessary, the number of ships employed being 4 at home and 4 abroad. Of the latter, 2 have been employed in the Far East and 2 in the Persian Gulf, Red Sea, and Mediterranean.

Considerable advance has been made in fitting echo sounding apparatus as an aid to navigation, and a new machine for sounding in comparatively shallow water by echo is under trial.

The special Fishery Research Ship *Challenger*, referred to in 1931, has been completed, but for financial reasons the fishery work for which she was built has been abandoned for the present. She has accordingly been taken over on loan for Fleet use from the Ministry of Agriculture and Fisheries as a measure of economy, and is to be used as a Surveying Ship in place of one of the Surveying Ships hitherto employed on Foreign Service.

#### METEOROLOGY.

Progress continued during the year, in collaboration with the Air Ministry, in the development of Fleet Meteorology, the improvement of meteorological instruments for the use of the Fleet Air Arm and of H.M. Ships generally, and the collection of meteorological data.

Special arrangements have been made for H.M. Ships to obtain upper air observations on certain days, selected by international agreement, during the calendar years 1932 and 1933.

#### NAVIGATION.

Reference was made last year to directions in which H.M. Ships were co-operating in the improvement of navigational aids and equipment.

The trials of instruments for finding the speed of ships at sea have now reached an advanced stage.

The observations in certain of H.M. Ships to ascertain the dip of the sea horizon are still being carried out.

#### FISHERY PROTECTION.

The work of the vessels of the Fishery Protection and Minesweeping Flotilla in protecting and assisting the fishing fleets and in training reserve officers and men in minesweeping has continued.

Its value was well illustrated when serious disputes between British and Danish fishermen occurred off the Danish coast early in October last. The Fishery Protection gunboat *Godetia* sailed at once for Esbjerg, where a meeting was held with the Danish Fishery Officer and the Consular bodies, and the dispute was promptly settled to the satisfaction of all parties. As a result of this discussion, moreover, understandings were reached which should greatly facilitate the prompt settlement of disputes in future.

During the year the Captain in command of Fishery Protection and Minesweeping vessels personally visited in H.M.S. *Harebell* the various fishing grounds and the principal fishing ports, including Icelandic and Norwegian ports and Bear Island. During these cruises valuable opportunities occurred for meeting the Fishery Officers and Captains of Norwegian and French Fishery Gunboats and for discussing various Fishery matters.

#### CO-OPERATION BETWEEN THE SERVICES.

Combined exercises with the Army and the Royal Air Force have continued to form part of the annual programme of squadrons whenever opportunity has offered, and have been productive of valuable results.

Exchanges of officers between the three fighting Services during tactical exercises have again been arranged with great advantage to those concerned.

#### NAVAL AIR WORK.

In the course of 1931 it was decided to institute the appointment of Rear-Admiral (Aircraft-Carriers), and Rear-Admiral R. G. H. Henderson hoisted his flag in H.M.S. *Courageous* in the Atlantic Fleet in September last. This step will greatly facilitate the progress in Fleet Air Arm work on uniform lines.

Considerable progress is being made with the installation of catapults. Seven are now fitted in capital ships and cruisers, and thirteen more will be fitted by the end of the financial year 1932.

The first flight of the new type single-seater fighter (Hawker *Nimrod*) is now in service. Delivery of a two-seater Fighter Reconnaissance type (Hawker *Osprey*) is about to commence. These two types are replacing the single-seater *Flycatcher* which has been in service since 1923.

One hundred and thirty-six Naval and Royal Marine Officers are now trained as Pilots for the F.A.A., and twenty-six are under training. Eighty-one Naval Officers are trained as Observers.

It is regretted that four fatal accidents occurred during the year, involving the deaths of five Naval Pilots and one Observer. One of these was a Naval Pilot attached to the High Speed Flight (Schneider Cup Team).

The Admiralty co-operated with the Air Ministry in the arrangements for the Schneider Trophy Meeting by controlling the sea traffic in the Solent, marking the course, and arranging for an Aircraft Carrier to be present to act as reception ship for Government guests.

#### WIRELESS TELEGRAPHY AND SIGNAL DEVELOPMENT.

The arrangements for broadcasting official messages to ships of the Merchant Navy have, by the co-operation of all concerned, reached a high standard of efficiency. On January 1, 1932, during the test period, H.R.H. The Prince of Wales was graciously pleased to utilise this means of transmitting a New Year greeting to ships of the Merchant Navy then at sea.

The calamitous earthquake at Hawkes Bay, New Zealand, referred to in last year's Statement, afforded a good example of signal efficiency. The small wireless staff of H.M.S. Veronica handled a total of 800 messages in the first eight days after the catastrophe (117 of these being dealt with during the first thirteen hours), and for a large part of that time formed the only link between the distressed area and the outside world.

#### PERSONNEL.

On December 3, 1931, H.R.H. Prince George, representing His Majesty the King, presented new Colours to the Portsmouth Division of the Royal Marines.

Consequent upon the report of a Committee referred to in the First Lord's Statement of a year ago, new regulations have been drawn up for promotion to commissioned rank from the lower deck. The alterations are designed mainly to ensure that the officers so promoted shall not be handicapped in education or training or in any other way in comparison with the officers entered as cadets, and in harmony with this principle the distinctive title of Mate has been abolished. The more important changes begin with the training which ratings will receive before actual selection. Consequently, although the scheme is already in force, it will not immediately affect the selections for commissioned rank which must continue to be made in accordance, in the main, with the old scheme until 1933.

It has been decided to bring to an end the practice of granting steps in rank to Naval and R.M. officers on or after retirement. The practice dates from 1870. Although it has not been without its uses as a system of reward and recognition of long and satisfactory service, it has had serious disadvantages. The large proportion of retired officers holding ranks in which they have rendered no service is open to the objection that it lowers the prestige attached to such ranks; also the system creates considerable anomalies when, in time of war or emergency, it becomes necessary to recall these officers to active service.

The system will be continued only in the case of commissioned officers from warrant rank, because inequalities of promotion frequently prevent deserving officers from reaching lieutenant's rank on the active list.

The status of the Officers' Stewards Branch has been improved, and the Branch has been put under the direct supervision of the Accountant Officer of the ship.

The training of Artificer Apprentices formerly carried out in hulks has now been transferred to new establishments on shore at Chatham, where up-to-date and suitable facilities have been provided.

#### MATÉRIEL. NEW CONSTRUCTION.

##### CRUISERS.

##### 1927 Programme.

The Exeter carried out satisfactory trials and was completed during 1931. She has been commissioned for service with the Atlantic Fleet (Second Cruiser Squadron).

##### 1929 Programme.

The construction at Devonport of the Leander, the first of the 6-inch gun ships, is progressing normally. She was launched on September 24, 1931, and is expected to carry out trials towards the end of the year and to complete early in 1933.

*1930 Programme.*

The Neptune and Orion were laid down at Portsmouth and Devonport respectively in September, 1931; the Achilles was laid down at the works of Cammell, Laird and Company, Limited, Birkenhead, in June, 1931. The construction of these vessels is proceeding satisfactory.

## LEADERS AND DESTROYERS.

*1927 and 1928 Programmes.*

The Acheron, a destroyer of the "Acasta" class fitted with experimental machinery, completed last autumn and is to be attached to the Atlantic Fleet.

The Leader Keith and the eight destroyers of the "Beagle" Class, viz. the Beagle, Basilisk, Blanche, Boadicea, Boreas, Brazen, Brilliant, and Bulldog joined the Mediterranean Fleet in the summer of 1931.

The trial performances of these destroyers showed a continued improvement in fuel economy over similar vessels previously built. In particular, the Acheron, fitted with special machinery using high-pressure steam, showed a fuel economy which is unequalled by any steam-driven warship.

The two destroyers, Saguenay and Skeena, ordered by the Canadian Government, were completed and handed over at the beginning of the financial year 1931.

*1929 Programme.*

The Leader Kempenfelt, completing at the works of J. S. White and Company, Limited, East Cowes, is expected to be delivered early in the financial year 1932.

The four destroyers of the "Crusader" class, the Crusader, Comet, Cygnet, and Crescent, which are under construction, two at Portsmouth Dockyard and two by Vickers-Armstrongs, Limited, are proceeding normally and should be delivered early in the financial year 1932, when they will join the Atlantic Fleet.

*1930 Programme.*

The Leader Duncan, under construction at H.M. Dockyard, Portsmouth, is proceeding satisfactorily, and should be completed about the end of the financial year 1932.

The eight destroyers of the "Defender" class, viz. the Defender and Diamond, building by Vickers-Armstrongs, Limited, the Delight and Dainty, building by the Fairfield Shipbuilding Company, the Diana and Duchess, building by Palmers Shipbuilding and Iron Company, Limited, and the Decoy and Daring, building by Thornycroft and Company, Limited, are proceeding satisfactorily, and it is anticipated that these vessels will be completed before the end of the financial year 1932.

## SUBMARINES.

*1928 Programme.*

The Rainbow, the last of the four vessels of the 1928 Programme, has carried out satisfactory trials and has been commissioned for service.

*1929 Programme.*

The Thames was launched at the works of Vickers-Armstrongs, Limited, Barrow-in-Furness, on January 26 last and is due to complete towards the end of the summer.

Work on the Swordfish and Sturgeon, which are building at Chatham, is proceeding normally. The Swordfish was launched on November 10, 1931, and is due to complete in the early autumn. The Sturgeon was launched on January 8 last and is due to complete at the end of the year.

*1930 Programme.*

The keel plates of the Seahorse and Starfish were laid at Chatham on September 14 and 26 respectively, and work is proceeding.

The Porpoise, building by Vickers-Armstrongs, Limited, was laid down at Barrow on September 22, 1931, and is due to complete in the spring of 1933.

## SHALLOW DRAUGHT GUNBOAT.

*1928 Programme.*

The Falcon was completed at Shanghai, whither the dismantled parts had been transhipped after erection at Yarrow and Company's works at Scotstoun. The vessel was commissioned at Shanghai in September, 1931.

## SLOOPS.

*1929 Programme.*

The Shoreham, Fowey, and Bideford have been completed during the year. It is anticipated that the Rochester, the remaining ship of this class, will be completed at Chatham Dockyard about the end of the current financial year.

*1930 Programme.*

The construction of the Falmouth, Weston-super-Mare, and Milford at Devonport Dockyard, and the Dundee at Chatham Dockyard, is proceeding normally. It is anticipated that these vessels will be completed in the financial year 1932.

## FISHERY RESEARCH VESSEL.

The Challenger satisfactorily completed her trials and will shortly be commissioned for Fleet surveying duties, as already explained.

## ADMIRALTY ADMINISTRATION.

Sir Charles Walker, K.C.B., Deputy Secretary of the Admiralty, retired on reaching the age of 60 last December after a distinguished service extending over more than 36 years. He has been succeeded by Sir Vincent W. Baddeley, K.C.B.

## DOCKYARD ADMINISTRATION.

The process of putting into force the changes recommended by Mr. R. S. Hilton's Committee on the financial system of the Dockyards continues. The changes at Devonport and Malta Dockyards are approaching completion. At Devonport the system of muster of workpeople at place of work by time-recorder clock and of paying wages at the clock muster on pay day is fully installed. Preliminary steps to effect similar changes at Chatham and, except clock mustering, at Sheerness are being taken.

The modernisation of dockyard equipment is proceeding on a steady basis.

## MISCELLANEOUS.

The policy of modernising the anti-aircraft fire control equipment of the Fleet has been continued in 1931, and as much progress as financial restrictions permitted has also been made with the supply of improved anti-aircraft weapons to the principal ships of the Fleet.

The new Experimental Tank at Haslar for testing ship models is now approaching completion, and it should be available in the summer. This new tank is considerably larger than the old one, which was completed in 1886, and the increased facilities it will afford both in size and equipment will be of definite advantage.

A generous offer to present a large telescope to the Royal Observatory was received from Mr. William Johnston Yapp through the Astronomer Royal last spring and was gratefully accepted by the Board of Admiralty. After careful consideration it was decided that the most useful addition to the equipment of the Observatory would be a 36-inch reflector, to meet the cost of which, with a spectroscope and a new 34-foot dome, Mr. Yapp has given £15,000. The new telescope will be devoted in the first place to spectroscopic observations of colour temperatures which have hitherto been carried on with some difficulty.

The Admiralty Engineering Laboratory continues to perform valuable work, particularly in the development of heavy-oil engines for Naval purposes.

The construction of the experimental type of high-speed compression-ignition engine at the Laboratory, of which mention was made last year, is well advanced. It is expected that trials will take place early in 1932.

Great interest has been taken in the progress of light high-speed heavy-oil engines for electric generating sets and machinery for boats, and various designs have been tested. Designs are now available covering a range of power from 30 h.p. to 400 h.p., and these are being utilised as opportunity arises in lieu of paraffin and petrol engines.

The use of light alloys and of special heat-resisting materials in connection with propelling machinery is being extended so far as circumstances warrant. The employment of special alloys for condenser tubes is being extended with satisfactory results.

The X-ray method of examination of material has advanced a further stage and has proved its value for enabling defects which might otherwise escape notice to be detected in the early stages of manufacture.

The use of welded structures has extended, and in particular the system has been adopted in an advanced application for the engine structure of a submarine.

The application of welding to ship construction has also been under continuous investigation. Experimental work has been pursued, and considerable progress has been made in the practical use of this process in ships now under construction.

A new type of boiler manufactured by Messrs. Babcock and Wilcox has been ordered for special trials on shore. If the trials prove satisfactory, this boiler will be fitted in the Net-Layer Guardian now under construction.

A number of different consignments of fuel oil produced by low-temperature carbonisation of coal have been tested by burning in Naval boilers, both at the Liquid Fuel Experimental Station at Haslar and in H.M.S. Tyrant, and the results, so far as such limited trials can show, were satisfactory. Fuel oil produced by the hydrogenation process has also been tested at the Admiralty Engineering Laboratory as a fuel for internal combustion engines with satisfactory results.

Experiments and developments at the Liquid Fuel Experimental Station have caused steady progress to be made in the improvement of the condition of combustion, durability, and efficiency of Naval boilers. There has been a marked gain in economy where these developments have been incorporated, both in old and new vessels.

Full-scale trials with a view to improving heat transmission on large boiler units suitable for Naval service are now in hand.

A special tank for training in the use of the Davis Submerged Escape Apparatus was completed at Fort Blockhouse on June 4, 1931. Training has since proceeded at the rate of approximately 30 officers and ratings per week. Training has proceeded as rapidly as possible and all submarine personnel will have been trained in the practical use of the apparatus shortly. A tank on generally similar lines is to be built at Hong Kong to enable the personnel of the submarines stationed in China to receive regular training.

An experimental salvage operation was carried out on Submarine L. 4 with specially designed pontoons, and by means of these the vessel, having been submerged in a dock at Portsmouth, was successfully brought to the surface again. Although the conditions of the trial were very favourable to the operation, valuable experience was gained as to plant and methods.

In continuation of the experiments in deep diving to which reference was made in last year's Statement, trials of diving in deep water, i.e. up to 50 fathoms depth, for periods of time of sufficient length to enable practical work to be carried out at that depth, were successfully carried out on an extensive scale in Loch Fyne last summer.

It is intended to confirm the results of these trials during the coming summer, after which it is anticipated that the Deep Diving Committee will be in a position to report fully and make recommendations regarding the practicability of instituting an organisation in H.M. Service for diving in emergency to much greater depths than have been possible in the past.

## ABSTRACT OF NAVY ESTIMATES FOR 1932.

Votes.		Estimates 1932.		Estimates 1931.
		Gross Estimate.	Net Estimate.	Net Estimate.
	<b>I.—NUMBERS.</b>		Maximum Numbers.	Maximum Numbers.
A.	{ Number of Officers, Seamen, Boys, and Royal Marines . . . }	91,410	91,410	93,650
	{ Number of Royal Marine Police . . }	865	865	550
	<b>II.—EFFECTIVE SERVICES.</b>	£	£	£
1	Wages, etc., of Officers and Men of the Royal Navy, and Royal Marines, and Civilians employed on Fleet Services }	12,684,049	12,627,000	13,686,000
2	Victualling and Clothing for the Navy .	3,723,751	3,074,300	3,401,200
3	Medical Establishments and Services .	451,876	380,700	400,500
4	Fleet Air Arm . . . . .	1,025,000	1,025,000	1,126,000
5	Educational Services . . . . .	278,330	218,400	232,000
6	Scientific Services . . . . .	542,324	473,800	482,500
7	Royal Naval Reserves . . . . .	350,350	350,000	389,700
8	Shipbuilding, Repairs, Maintenance, etc. :			
	Section I.— <i>Personnel</i> . . .	6,387,255	6,324,700	6,427,000
	Section II.— <i>Matériel</i> . . .	5,187,550	4,464,750	4,683,370
	Section III.—Contract Work .	5,238,170	5,193,200	4,456,200
9	Naval Armaments . . . . .	3,744,225	3,488,200	3,433,500
10	Works, Buildings, and Repairs at Home and Abroad . . . . . }	2,520,700	2,245,700	2,288,500
11	Miscellaneous Effective Services . .	704,447	641,250	661,230
12	Admiralty Office . . . . .	1,115,583	1,104,300	1,141,200
	Total Effective Services . . . £	43,953,610	41,611,300	42,809,400
	<b>III.—NON-EFFECTIVE SERVICES.</b>			
13	Naval and Marine, Officers . . . .	3,106,705	3,093,500	3,127,500
14	Naval and Marine, Men . . . . .	4,746,350	4,727,800	4,650,400
15	Civil Superannuation, Compensation Allowances, and Gratuities . . }	1,046,647	1,043,700	1,017,700
	Total Non-Effective Services . . £	8,899,702	8,865,000	8,795,600
	GRAND TOTAL . . . . . £	52,853,312	50,476,300	51,605,000

NET DECREASE . . . . . £1,128,700.

ADMIRALTY, 16 Feb., 1932	{ B. EYRES-MONSELL F. L. FIELD, C. FULLER,	ROGER BACKHOUSE, L. G. PRESTON, FRED C. DREYER,	STANLEY, EUAN WALLACE, O. MURRAY.
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**STATEMENT SHOWING THE NUMBERS BORNE, THE EXPENDITURE ON NAVAL SERVICES FOR THE YEARS 1917 TO 1930, AND THE ESTIMATES FOR 1931 AND 1932.**

YEAR	VOTE A. Average numbers borne. (a)	VOTE 1. Wages, &c., of Contract &c.	VOTE 2. Vetemi- ling and Clothing.	VOTE 3. Medical Establish- ments, &c.	VOTE 4. Civilians employed in Services.	VOTE 5. Educa- tional Services.	VOTE 6. Scientific Services.	VOTE 7. Royal Naval Reserves	VOTE 8.			VOTE 9. Naval Arma- ments.	VOTE 10. Works.	VOTE 11. Miscel- laneous.	VOTE 12. Admiralty Office.	VOTE 13. Half Pay, &c.	VOTE 14. Naval &c. Pensions.	VOTE 15. Civil Superannua- tion, &c.	Balances irrecover- able.	Total Expenditure.
									Shipbuilding, Repairing, Maintenance, &c.	Section I. Personnel.	Section II. Materiel.									
1917	406,977	£ 37,559,536	£ 13,481,159	£ 792,569	£ 661,308	£ 210,243	£ 152,160	£ 874,930	£ 12,660,160	£ 36,494,694	£ 70,609,055	£ 34,177,359	£ 6,556,799	£ 9,198,802	£ 709,227	£ 704,914	£ 8,733,778	£ 413,746	£ 41,092	£ 227,388,891
1918	381,311	£ 46,373,511	£ 24,219,351	£ 1,158,287	£ 491,270	£ 247,922	£ 292,886	£ 871,970	£ 15,087,763	£ 59,128,675	£ 94,248,874	£ 64,866,784	£ 10,928,241	£ 9,357,532	£ 1,985,894	£ 704,914	£ 8,733,778	£ 445,485	£ 28,090	£ 334,091,227
1919	176,087	£ 32,385,306	£ 8,823,106	£ 733,046	£ 556,778	£ 401,864	£ 364,832	£ 458,044	£ 12,428,177	£ 48,348,933	£ 14,441,835	£ 5,595,608	£ 4,992,969	£ 5,724,974	£ 1,176,937	£ 704,914	£ 8,733,778	£ 802,279	£ 60,875	£ 154,064,044
1920	124,009	£ 21,314,360	£ 8,311,708	£ 683,830	£ 759,110	£ 503,152	£ 249,185	£ 359,694	£ 12,096,747	£ 6,799,965	£ 12,001,445	£ 8,498,951	£ 4,992,969	£ 5,724,974	£ 2,078,704	£ 704,914	£ 8,733,778	£ 880,996	£ 23,611	£ 92,505,290
1921	127,180	£ 19,220,859	£ 6,831,481	£ 643,735	£ 480,243	£ 405,592	£ 359,575	£ 423,056	£ 10,690,188	£ 8,835,771	£ 4,834,336	£ 6,253,468	£ 4,746,485	£ 3,506,514	£ 1,780,641	£ 2,002,201	£ 3,581,368	£ 1,020,693	£ 60,935	£ 75,986,141
1922	107,782	£ 15,762,232	£ 4,767,118	£ 492,419	£ 258,600	£ 332,065	£ 354,961	£ 423,722	£ 7,075,533	£ 3,877,716	£ 3,225,598	£ 3,678,783	£ 3,553,831	£ 2,096,219	£ 1,371,961	£ 3,701,964	£ 5,471,088	£ 968,580	£ 29,679	£ 57,492,389
1923	99,107	£ 14,175,111	£ 4,153,803	£ 410,842	£ 193,793	£ 330,644	£ 379,489	£ 459,391	£ 6,751,496	£ 5,521,336	£ 4,427,874	£ 3,840,606	£ 3,215,766	£ 985,173	£ 1,247,813	£ 2,856,764	£ 4,260,245	£ 823,340	£ 38,864	£ 54,064,350
1924	96,453	£ 14,150,863	£ 4,152,902	£ 442,756	£ 190,669	£ 334,648	£ 393,054	£ 446,902	£ 7,489,659	£ 5,592,183	£ 5,415,210	£ 3,507,190	£ 3,140,887	£ 1,065,869	£ 1,349,519	£ 2,868,798	£ 4,828,626	£ 811,797	£ 12,355	£ 55,693,787
1925	100,284	£ 14,576,499	£ 4,226,570	£ 440,209	£ 1,320,000	£ 327,226	£ 417,552	£ 465,114	£ 7,929,259	£ 6,305,184	£ 6,396,406	£ 4,247,113	£ 2,422,050	£ 826,119	£ 1,307,790	£ 2,812,336	£ 4,449,585	£ 928,326	£ 8,110	£ 60,004,548
1926	100,701	£ 14,322,678	£ 4,236,846	£ 434,919	£ 681,000	£ 324,036	£ 393,339	£ 444,759	£ 7,487,952	£ 5,422,141	£ 7,275,173	£ 3,595,037	£ 2,106,441	£ 930,369	£ 1,293,639	£ 2,914,419	£ 4,450,140	£ 894,472	£ 23,002	£ 57,142,892
1927	101,916	£ 14,568,462	£ 4,182,491	£ 423,777	£ 882,000	£ 224,334	£ 402,976	£ 419,086	£ 7,067,419	£ 4,678,052	£ 8,839,423	£ 3,996,749	£ 1,900,788	£ 844,852	£ 1,233,182	£ 2,966,455	£ 4,525,353	£ 965,602	£ 2,276	£ 58,123,257
1928	100,680	£ 14,435,347	£ 3,992,639	£ 418,863	£ 1,008,300	£ 226,486	£ 396,296	£ 403,295	£ 6,743,571	£ 5,074,290	£ 8,263,060	£ 3,871,235	£ 1,950,207	£ 728,841	£ 1,181,125	£ 3,006,321	£ 4,496,310	£ 944,735	£ 4,923	£ 57,130,146
1929	99,300	£ 14,296,313	£ 3,840,098	£ 419,371	£ 1,066,000	£ 226,449	£ 467,343	£ 387,241	£ 6,561,827	£ 4,977,230	£ 7,291,217	£ 3,868,359	£ 2,078,775	£ 725,511	£ 1,194,842	£ 3,075,656	£ 4,556,155	£ 968,944	£ 1,239	£ 55,967,770
1930	94,921	£ 13,996,925	£ 3,531,280	£ 394,505	£ 1,267,000	£ 224,722	£ 470,965	£ 395,648	£ 6,227,647	£ 4,198,553	£ 5,532,728	£ 3,557,624	£ 1,928,639	£ 667,107	£ 1,178,675	£ 3,121,672	£ 4,592,970	£ 983,198	£ 5,033	£ 52,574,186
1931 estimate	93,650(c)	£ 13,686,000	£ 3,401,200	£ 400,500	£ 1,126,000	£ 232,000	£ 482,500	£ 389,700	£ 6,427,000	£ 4,683,870	£ 4,456,200	£ 3,433,500	£ 2,288,500	£ 661,230	£ 1,141,200	£ 3,127,500	£ 4,650,400	£ 1,017,700	£ —	£ 51,605,000
1932 estimate	91,410(c)	£ 12,627,000	£ 3,074,300	£ 380,700	£ 1,025,000	£ 218,400	£ 473,800	£ 350,000	£ 6,324,700	£ 4,464,750	£ 5,193,200	£ 3,488,200	£ 2,245,700	£ 641,250	£ 1,104,800	£ 3,093,500	£ 4,727,800	£ 1,043,700	£ —	£ 50,476,300

*Note.*—The figures for Expenditure represent the Net Expenditure after taking into account receipts noted in the Navy Appropriation Account as receipts in excess of estimated Appropriations in Aid.

(a) Exclusive of Royal Marine Police.

(b) Replacing "Citizens employed on Fleet Services," transferred to Vote 1 in 1925.

(c) Maximum for the year.



# EXPENDITURE FOR NAVAL PURPOSES OF THE PRINCIPAL FOREIGN POWERS.

## UNITED STATES NAVY.

APPROPRIATION BILL, 1932 (July 1, 1932, to June 30, 1933).

Appropriation Title.	Appropriations.	
	1932-33. Dollars.	1931-32. Dollars.
Salaries, office of the Secretary of the Navy . . . . .	215,520	215,520
Salaries, General Board . . . . .	12,560	12,880
Salaries, Naval Examining Board . . . . .	10,600	10,600
Salaries, Compensation Board . . . . .	8,700	8,700
Contingent expenses, Navy Department . . . . .	80,000	85,000
Printing and binding . . . . .	550,000	575,000
Pay, Miscellaneous . . . . .	1,450,000	1,555,500
Contingent, Navy . . . . .	15,000	30,000
State Marine Schools . . . . .	217,600	100,000
Care of lepers, Guam . . . . .	35,000	38,000
Operation and conservation of Naval Fuel Reserves . . . . .	—	160,000
Naval Research Laboratory . . . . .	213,000	229,765
Salaries, office Naval Records and Library . . . . .	39,240	39,960
Salaries, office of Judge Advocate General . . . . .	130,240	130,240
Salaries, office of Chief of Naval Operations . . . . .	73,760	73,760
Salaries, Board of Inspection and Survey . . . . .	20,780	21,280
Salaries, Naval Communications . . . . .	134,980	136,120
Salaries, Office of Naval Intelligence . . . . .	41,440	41,620
Recreation for enlisted men . . . . .	368,000	400,000
Contingent, navigation . . . . .	9,000	10,000
Gunnery and engineering exercises . . . . .	42,750	50,000
Instruments and supplies . . . . .	533,243	776,091
Ocean and lake surveys . . . . .	65,000	86,600
Naval training station, California . . . . .	160,200	190,000
Naval training station, Rhode Island . . . . .	202,000	271,000
Naval training station, Great Lakes . . . . .	245,000	275,000
Naval training station, Hampton Roads . . . . .	225,000	235,000
Naval Reserve . . . . .	3,077,686	4,620,835
Naval Reserve Officers' Training Corps . . . . .	90,085	130,000
Naval War College . . . . .	110,000	116,958
Salaries, Bureau of Navigation . . . . .	500,540	500,540
Salaries, Hydrographic Office . . . . .	430,980	431,980
Contingent and miscellaneous expenses, Hydrographic Office . . . . .	138,120	144,500
Salaries, Naval Observatory . . . . .	193,540	196,300
Contingent and miscellaneous expenses, Naval Obser- vatory . . . . .	25,000	42,500
Astrographic and astronomical plant . . . . .	114,000	50,000
Engineering . . . . .	18,030,000	19,243,040
Engineering Experimental Station, Annapolis . . . . .		
Salaries, Bureau of Engineering . . . . .	333,040	333,040
Construction and repair of vessels . . . . .	15,821,000	18,451,400
Salaries, Bureau of Construction and Repair . . . . .	393,900	393,900
Ordnance and ordnance stores . . . . .	11,271,000	11,930,585
Torpedoes and appliances . . . . .		
Purchase and manufacture of smokeless powder . . . . .	1,000,000	1,000,000

UNITED STATES NAVY—*continued.*

Appropriation Title.	Appropriations.	
	1932-33. Dollars.	1931-32. Dollars.
Salaries, Bureau of Ordnance . . . . .	165,000	166,020
Pay, Subsistence and transportation . . . . .	149,877,831	154,040,870
Maintenance, supplies and accounts . . . . .	9,417,500	10,100,000
Fuel and transportation . . . . .	6,735,000	8,513,171
Salaries, Bureau of Supplies and Accounts . . . . .	873,000	876,220
Medical Department . . . . .	1,840,000	2,080,000
Care of the dead . . . . .	68,000	75,000
Salaries, Bureau of Medicine and Surgery . . . . .	87,560	87,560
Maintenance, Yards and Docks . . . . .	8,400,000	9,014,816
Contingent, Yards and Docks . . . . .	138,000	150,000
Salaries, Bureau of Yards and Docks . . . . .	314,020	317,300
Public works . . . . .	2,490,000	12,164,000
Aviation, Navy . . . . .	25,245,420	31,145,000
Salaries, Bureau of Aeronautics . . . . .	290,400	290,400
Pay, Naval Academy . . . . .	861,517	919,154
Current and miscellaneous expenses, Naval Academy . . . . .	79,700	90,000
Maintenance and repairs, Naval Academy . . . . .	940,000	1,000,000
Pay, Marine Corps . . . . .	15,151,089	16,471,185
Pay, civil employees, Marine Corps . . . . .	305,030	305,567
General expenses, Marine Corps . . . . .	6,458,720	8,598,435
Increase of the Navy—C. and M. . . . .	15,063,000	31,100,000
Increase of the Navy, A. A. and A. . . . .	3,000,000	7,200,000
Modernisation of vessels . . . . .	14,000,000	—
Contract authorisation for aeroplanes . . . . .	—	7,700,000
Total Annual appropriations. . . . .	317,583,591	358,253,952
Total Permanent and indefinite . . . . .	1,322,550	1,838,510
Total . . . . .	318,906,141	360,092,462

## IMPERIAL JAPANESE NAVY.

ESTIMATES, 1932-33 (April 1, 1932, to May 31, 1933).

The Estimates of the Imperial Japanese Navy are divided under two headings "Ordinary" and "Extraordinary."

The figures for 1932-33 as compared with the previous year are as follows:—

	1932-33. Yen.	1931-32. Yen.
Ordinary . . . . .	—	141,209,983
Extraordinary . . . . .	—	69,665,155
Total . . . . .	211,700,712	210,875,138

The "Ordinary" expenditure is for pay, provisions, etc., and the general upkeep of the Fleet and its Air Service, and the "Extraordinary" expenditure for new construction and additions and improvements to the present Fleet and its Air Service and establishments.

## FRENCH NAVY.

## ESTIMATES, 1932-33.

The figures for 1932-33, including the votes for new construction, as compared with the previous year, are as follows:—

	1932-33. France.	1931-32. France.
Ordinary . . . . .	1,094,418,054	1,841,691,566
Extraordinary . . . . .	1,316,845,523	1,498,188,748
Total . . . . .	<u>2,411,263,577</u>	<u>2,839,880,314</u>

## ROYAL ITALIAN NAVY.

## ESTIMATES, 1932-33.

(July 1, 1932—June 30, 1933.)

## ORDINARY EXPENDITURE.

	1932-33. Lire.	1931-32. Lire.
General Expenses . . . . .	5,264,800	5,879,800
Pensions . . . . .	99,070,000	104,070,000
Education . . . . .	—	—
Lighthouses and Pilotage . . . . .	6,803,000	6,708,000
Maintenance, Construction, Armaments, Establish- ments, and Coast Works	1,054,960,000	1,049,955,000
Supplementary . . . . .	—	—
Total . . . . .	<u>1,165,597,800</u>	<u>1,166,107,800</u>

## EXTRAORDINARY EXPENDITURE.

General expenses of the Navy and Various . . . . .	378,325,477	371,515,000
Transfer of Funds . . . . .	36,000,000	36,000,000
Total . . . . .	<u>1,574,923,277</u>	<u>1,573,622,800</u>

## GERMANY.

(April 1, 1932—March 31, 1933.)

	1932-33. Reich Marks.	1931-32. Reich Marks.
Gross . . . . .	187,339,400	189,355,550
Appropriations in aid . . . . .	3,835,050	5,851,200
Nett . . . . .	<u>183,504,350</u>	<u>183,504,350</u>

## BRITISH AND FOREIGN NAVIES.

## PRINCIPAL OFFICIALS.

## GREAT BRITAIN.

*First Lord*.—The Right Hon. Sir Bolton M. Eyres-Monsell, G.B.E., M.P.  
*First Sea Lord and Chief of Naval Staff*.—Admiral Sir Frederick L. Field, K.C.B., K.C.M.G.  
*Second Sea Lord and Chief of Naval Personnel*.—Vice-Admiral A. Dudley P. R. Pound, C.B.  
*Third Sea Lord and Controller*.—Rear-Admiral C. M. Forbes, C.B., D.S.O.  
*Fourth Sea Lord and Chief of Supplies and Transport*.—Rear-Admiral G. Blake, C.B., D.S.O.  
*Deputy Chief of Naval Staff*.—Vice-Admiral Sir Frederic C. Dreyer, K.C.B., C.B.E.  
*Civil Lord*.—Captain David Euan Wallace, M.C., M.P.  
*Parliamentary and Financial Secretary*.—Lord Stanley, M.C., M.P.  
*Permanent Secretary*.—Sir Oswyn A. R. Murray, G.C.B.

## FOREIGN POWERS.

Country.	Minister of Marine.	Chief of Staff.
Argentina . . .	Captain S. Casal	Rear-Admiral R. Storni
Brazil . . .	Rear-Admiral Protogenes	Rear-Admiral de Silva
Chile . . .	Don Miguel Urrutia	Captain Julio Merino
China . . .	Admiral Chen Shao Kwan	—
Denmark . . .	Monsieur Rasmussen	Rear-Admiral H. Rechnitzer
France . . .	Mons. G. Leygues	Vice-Admiral Durand-Viel
Germany . . .	General von Schleicher	Admiral Dr. Raeder
Greece . . .	P. Argyropoulos	Captain Dimoulis
Italy . . .	Am. di Divisione G. Sirianni, C.M.G.	Am. di Squadra G. Ducci
Japan . . .	Admiral K. Okada	Admiral N. Tanaguchi, K.C.M.G.
Netherlands . .	Dr. L. N. Deckers	Rear-Admiral J. de Graaff
Norway . . .	Mons. Quisling	Rear-Admiral Von der Lippe
Peru . . .	Sr. Nunez Chavez	Rear-Admiral W. S. Pye (Captain, U.S.N.)
Poland . . .	Marshal Pilsudski	Rear-Admiral J. Swirski
Portugal . . .	Rear-Admiral Magalhaes Correia	—
Soviet Union . .	N. E. Voroshilov (President, Committee of Defence)	R. A. Muklevitch
Spain . . .	Rear-Admiral D. Salvador Carvia y Caravaca	Vice-Admiral D. Jose Nunez Quijano
Siam . . .	Ad. H.S.H. Prince Vudhijai	R.-A. Phra Rajvangsang
Sweden . . .	A. W. Rundqvist	Rear-Admiral Lybeck
United States . .	Charles F. Adams	Admiral W. V. Pratt

Corrected to December, 1932.

## BRITISH AND FOREIGN NAVAL ATTACHÉS.

## BRITISH NAVAL ATTACHÉS ACCREDITED TO FOREIGN COUNTRIES.

To:—

Albania, Bulgaria, Greece, Italy, Yugoslavia, Roumania, and Turkey: Naval Attaché, Captain R. B. Ramsay, R.N. (appointed 28th April, 1931); Headquarters, Rome, Italy.

Belgium, France, Netherlands, Portugal and Spain: Naval Attaché, Captain J. U. P. Fitzgerald (appointed 8th October, 1931); Headquarters, Paris, France.

Denmark, Esthonia, Finland, Germany, Latvia, Lithuania, Norway, Poland and Sweden: Naval Attaché, Commander M. A. Hawes (appointed 4th April, 1929); Headquarters, Berlin, Germany.

Japan and China: Naval Attaché, Captain M. G. B. Legge, D.S.O. (appointed 27th December, 1929); Assistant Naval Attaché Engineer Commander C. B. Evington (appointed 4th June, 1930); Headquarters, Tokyo, Japan.

U.S.A., Cuba, Mexico, and Panama: Naval Attaché, Captain P. Macnamara (appointed 28th March, 1931); Assistant Naval Attaché, Engineer-Commander J. S. Orr (appointed 12th January, 1932); Headquarters, Washington, U.S.A.

South America, including the Argentine Republic, Brazil, Chile, Ecuador, Peru, and Uruguay: Naval Attaché, Captain E. de F. Renouf, C.V.O. (appointed 15th August, 1930).

## FOREIGN NAVAL ATTACHÉS ACCREDITED TO GREAT BRITAIN.

From:—

Argentine Republic: Naval Attaché (none at present): 30, Grosvenor Gardens, S.W.1.

Brazil: Naval Attaché (none at present): Abford House, Wilton Road, London, S.W.1.

Chile: Naval Attaché (none at present).  
3, Hamilton Place, Park Lane, London, W.1.

Denmark: Naval Attaché (Post vacant).

France: Naval Attaché, Capitaine de Vaisseau, Y. Douval; Assistant N.A., (none at present): Address, Albert Gate House, Hyde Park, London, S.W.1.

Greece: Naval and Air Attaché, Commander Spyridion Matessis; Assistant N. & A. A., Commander Evangelos Roussos: Address, Flat B, Upper Feilde, Park St., London, W.1.

Italy: Naval Attaché, Captain Angelo Iachino; Assistant N.A. (none at present): Address, 4, Three Kings Yard, Davies Street, W.1.

Japan: Naval Attaché, Captain Shiro Takasu, I.J.N.; Assistant Naval Attaché, Commander S. Yano, I.J.N.: Address, Broadway Court, Westminster, London, S.W.1.

Norway: Naval Attaché (Post vacant): Address, Offices of the Norwegian Legation, 21-24, Cockspur Street, London, S.W.1.

Peru: Naval Attaché, Captain Don Manuel D. Faura: Address, Peruvian Legation, 65, Cadogan Square, London, S.W.1.

Roumania: Commander Gheorghe Niculescu, 4, Cromwell Place, London, S.W.7.

Serbs, Croats and Slovenes (Kingdom of): Naval and Air Attaché, Captain Vladimir Mariasevic: Address, c/o Yugo-Slavian Legation, 195, Queen's Gate, London, S.W.7.

Spain: Naval Attaché, Capitan de Corbeta Don Juan Pastor y Tomasety: Address, 64, Victoria Street, London, S.W.1.

Sweden: Naval Attaché, Captain E. A. Öberg: Address, Swedish Legation, 27, Portland Place, London, W.1.

United States of America: Naval Attaché, Captain A. Le R. Bristol, U.S.N.; Assistant Naval Attachés, Captain Howard (C.C.), Lieutenant Commander G. D. Murray, U.S.N., Lieutenant Commander Howard E. Kingman, U.S.N., Commander H. D. Bode, U.S.N.: Address, 6, Grosvenor Gardens, Westminster, London, S.W.1.

Uruguay: Naval Attaché (Post vacant).

DIMENSIONS AND PARTICULARS  
OF  
BRITISH AND FOREIGN WARSHIPS.



## LIST OF BRITISH AND FOREIGN SHIPS.

Warships are arranged alphabetically, except in certain cases in which vessels of the same class have been kept together. The following abbreviations are used throughout the List:—

a.c. Armoured cruiser.	s.c. Seaplane carrier.
a.g.b. Armoured gunboat.	g.b. Gunboat.
b. Battleship.	H.A. High angle = A.A. Anti-aircraft.
b.c. Battle-cruiser.	H.N.S. Harvey nickel steel.
l.cr. Light cruiser.	H.S. Harveyised or similar hard-faced steel.
Flot. ldr. Flotilla leader.	K.S. Krupp steel.
c.d.s. Coast-defence ship.	t. Turret-ship (in class column).
P. L. Cr. Protected light cruiser.	t. Speed and H.P. at trials (in speed and H.P. columns).
M.Cr. Minelaying cruiser.	
cr. Cruiser.	
A.A. Anti-aircraft guns.	
A.C. Aircraft carrier.	
A.T. Aircraft tender.	
L. Light guns under 15 cwt., including boats' guns.	
M. Machine guns.	
sub. Submerged torpedo tube.	a.w. Above water torpedo tube.

The following abbreviations are used to distinguish the various types of boilers:—

W.T. Water-tube boilers, where the type is not known.	My. Myabara.
B. Belleville.	N. or Nic. Niclausse.
Bl. Blechynden.	Nor. Normand.
B. & W. Babcock and Wilcox.	N.S. Normand-Sigaudy.
D'A. D'Allest.	T. Thornycroft.
	T.S. Thornycroft-Schulz.
	Y <sup>1</sup> . Yarrow small tube.
	Y <sup>2</sup> . Yarrow large tube.

The following abbreviations distinguish types of turbines:—

P.T. Parsons.	C.T. Curtis.
(G.) Geared turbines.	B.C.T. Brown-Curtis.

In later pages (marked p1, p2, etc., towards the end of the volume) plans of most of the ships appear.

Unless otherwise stated, the displacements are Standard displacements (*i.e.* excluding fuel and reserve feed water).

In some cases for Capital Ships the displacements accepted at the Washington Conference of 1921-2 are also given.



# GREAT BRITAIN.—Battleships and Battle Cruisers.

Class.	NAME. DATE FOR SCRAPPING UNDER WASHINGTON TREATY.	Standard Displacement.	Length. (Extreme).	Beam (Extreme).	Normal Draught.	Horse- Power.	Where Built.	Makers of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.					Armament.		Speed.	Fuel. Coal. Oil.	Complement (War).	
												Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Gun Position. Second- ary.	Guns.				Torpedo Tubes.
b.	Barham 1935	31,100 tons.	613 ft.	104 ft.	31 ft.	75,000 B. & W.	Clydebank	J. Brown B.C.T.	1914	1915	2,408,000 £	in. 13-6	in. 3-1	in. 6	in. 4-2	in. 11	in. 6	8 15-in., 12 6-in., 4 4-in. A.A., 4 3-pr.; 5 M.; 11 L.	2 (sub.) 21"	25	— 3400	1196
b.c.	Hood 1941	42,100 tons.	860 ft.	105 ft.	32 ft.	144,000	Clydebank	J. Brown B.C.T. (G.)	1918	1920	5,843,039*	12-6	3-1	7-5	5-4	11	(a)	8 15-in., 12 5-5-in., 4 4-in. A.A., 4 3-pr.; 5 M.; 10 L.	4 a.w. 2 (sub.) 21"	31	— 4000	1341
b.	Malaya 1936	31,100 tons.	610 ft.	104 ft.	31 ft.	75,000 B. & W.	Walker	Wallsend P.T.	1915	1916	¶	13-6	3-1	6	4-2	11	6	8 15-in., 12 6-in., 4 4-in. A.A., 4 3-pr.; 5 M.; 11 L.	2 (sub.) 21"	25	— 3400	1136
b.	Nelson 1942	33,500 tons.	710 ft.	106 ft.	30 ft.	45,000	Newcastle-on-Tyne	Wallsend	1925	1927	6,410,071*	14	6½	..	..	16	..	9 16-in., 12 6-in., 6 4-7-in. A.A.; 4 3-pr., 6 2-pr.; 24" 5 M.; 11 L.	2 (sub.) 24"	23	— 4000	1360
b.	Queen 1935	31,100 tons.	644 ft.	104 ft.	31 ft.	75,000 B. & W.	Portsmouth	Wallsend P.T.	1913	1915	2,943,000	13-6	3-1	6	4-2	11	6	8 15-in., 12 6-in., 4 3-pr., 4 4-in. A.A.; 5 M.; 11 L.	2 (sub.) 21"	25	— 3400	1187



## GREAT BRITAIN.—Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme).	Beam. (Extreme).	Draft.	Horse-Power.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel. Coal. Oil.	Complement (War).
												Belt.	Deck.	Gun Position.	Guns.			
A.C.	Argus	14,450 tons.	567 ft.	75 ft. 9 in.	21 ft. 0 in.	20,000	Dalmuir.	Beardmore T.	1917	1918	£ Purchased under construction do.	in. . .	in. . .	6 4-in. A.A., 4 3-pr. 4 M., 10 L., 20 aircraft 4 M., 10 L.	—	knots. 20·2	— tons. 2000	360
S.C.	Ark Royal*	6,900	366	50 10 17	6	3000	Blyth	Blyth S. B. Co.	1914	1914	1,785,940 (a) 2,115,944 (b)	..	..	..	..	11	—	139
A.C.	Courageous	22,500	786½	89 10 22	3	90,000	Belfast Y.	Walker, Parsons (Armstr'g) Harland & Wolff T. (G.)	1916	As aircraft carriers.	1928	3	9-7	16 47-in., 4 3-pr., 4 2-pr., 4 M., 42 L.	—	30½	—	750
A.C.	Glorious									As aircraft carriers.	1930	3	9-7					
A.C.	Eagle, ex-Almiraute Cochrane.	22,600	667½	105 2 21	11 50,000	Walker	J. Brown T.	1918	1924	3,310,042	..	..	..	9 6-in., 5 4-in. A.A., 4 3-pr., 32 smaller	—	24	—	746
A.C.	Furious	22,450	786½	90 1 21	6 90,000	Walker	Wallsend (Armstrong) Eng'g Co. T. (G.)	1916	1925	1,920,000†	3	3	7	10 5·5-in., 3 4-in. A.A., 4 3-pr., 4 2-pr., 46 smaller	—	31	—	710
A.C.	Hermes	10,850	599½	70 3 18	7 40,000	Elswick	Parsons Co. T. (G.)	1919	1924	2,030,263§	..	..	..	6 5·5-in., 3 4-in. A.A., 4 3-pr., 2 2-pr. Pom Poms; 4 M., 16 L.	—	25	—	531

\* Used for experimental work.

† Estimated cost excluding armament and ordnance stores.

(a) First cost of ship as a cruiser.

(b) Estimated cost of reconstruction as an aircraft carrier.

§ Estimated cost including guns.

# GREAT BRITAIN.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draft.	Horse-Power.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel.		Complement (War).
												Belt.	Deck.	Gun Position.	Guns.	Torpedo Tubes.	Coal.	Oil.	
Cr.	Arethusa	5,450	ft.	ft. ins.	ft. ins.	..	Chatham	Parsons	Bldg.	..	£	in.	..	in.	6-in. guns	..	tons.	..	..
Cr.	Ajax	7,000	..	..	..	..	Barrow	Vickers	"	..	..	..	..	..	6-in. guns	..	..	..	..
Cr.	Amphion	7,000	..	..	..	..	Portsmouth	Beardmore	"	..	..	..	..	..	6-in. guns	..	..	..	..
Cr.	Achilles	7,000	..	..	..	..	Birkenhead	Cammell	1932	..	..	..	..	..	6-in. guns	..	..	..	..
Cr.	Neptune	7,000	..	..	..	..	Portsmouth	Parsons	1933	Bldg.	..	..	..	..	6-in. guns	..	..	..	..
Cr.	Orion	7,000	..	..	..	..	Devonport	Vickers-Armstrongs	1932	..	..	..	..	..	6-in. guns	..	..	..	..
Cr.	Leander	7,000	554½	55	2 16	072,000	Devonport	Vickers-Armstrongs	1931	1933	1,641,000*	..	..	..	8 6-in., 4 4-in. A.A., 4 3-pr. guns	..	32½	1900	395
M.Cr.	Adventure	6,740	521	59	0 14	540,000	Devonport	Vickers	1924	1927	1,258,503*	..	..	..	4 4-7-in. A.A., 4 3-pr., 4 2-pr., 2 M., 8 L. 310 mines	..	27½	—	685
Cr.	Berwick	9,750	630	68	4 16	380,000	Govan	Fairfield	1926	1928	2,054,208*	..	..	..	8 6-in., 4 4-in. A.A., 4 3-pr., 4 2-pr., 4 M., 8 L., 1 aircraft	8	31½	3200	368
Cr.	Cornwall	9,750	630	68	4 16	380,000	Devonport	Beardmore	1926	1928	2,252,110*	..	..	..	8 6-in., 4 4-in. A.A., 4 3-pr., 4 2-pr., 4 M., 8 L., 1 aircraft	21"	—	—	—
Cr.	Cumberland	9,750	630	68	4 16	380,000	Barrow	Vickers	1926	1928	1,960,821*	..	..	..	8 6-in., 4 4-in. A.A., 4 3-pr., 4 2-pr., 4 M., 8 L., 1 aircraft	21"	—	—	—
P. L. Cr.	Comus	3,895	446½	41	9 13	640,000	Newcastle (Swan Hunter)	Wallsend Eng'n'g Co. P.T.	1914	1915	380,583	3	—	..	4 6-in., 2 3-in. A.A., 4 3-pr., 2 2-pr. Poms; 1 M.; 8 L.	4 a.w. 21"	—	917	368

\* Total estimated cost of ship, including guns.



# GREAT BRITAIN.—Cruisers—continued.

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Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.			Armament		Speed.	Fuel.		Complement (War).
			ft.	ft. ins.	ft. ins.							Belt.	Deck.	Gun Position	Guns.	Torpedo Tubes.		Coal.	Oil.	
P. L. Cr.	Cairo						Birken-head	Cannell	1918	1919	£ 794,529	in.		in.						
"	Calcutta						Barrow	Laird T. (G.) Vickers T. (G.)	1918	1919	851,988	3								
"	Capetown	4200	451½	43 10	14	1 40,000	Birken-head	Cannell	1919	1922	1,002,674				5 6-in., 2 3-in. A.A., 4 3-pr.; 2 2-pr. Pom	8 a.w. 21"	29	—	950	415
"	Carlisle						Govan	Fairfield	1918	1918	669,216				Poms; 2 m.; 8 L.					
"	Colombo						Govan	T. (G.)	1918	1919	692,308									
"	Caledon						Birken-head	Cannell	1916		547,300									
"	Calypso	4180	450	43 1	14	1 40,000	Newcastle (Hawthorn)	Hawthorn	1917	1917	529,190	3			5 6-in., 2 3-in. A.A., 4 3-pr.; 2 2-pr. Pom	8 a.w. 21"	29	—	935	420
"	Caradoc						Greenock	Leslie T. (G.) Scott's T. (G.)	1916		534,583				Poms; 2 m.; 8 L.					
"	Champion						Newcastle (Hawthorn)	Hawthorn	1915	1915	409,609									
"	Cambrian						Pembroke	Cannell	1916	1916	493,518									
"	Canterbury	3920	446½	41 9	13	6 40,000	Clydebank	Laird T. J. Brown T.	1915	1916	300,000†	3			4 6-in., 2 3-in. A.A., 4 3-pr.; 2 2-pr. Pom	2 sub. 21"	29	—	841	368
"	Castor						Birken-head	Cannell	1915	1915	358,300				Poms; 1 m.; 8 L. [Champion 1 3-in. A.A., and no 3-pr.]					
"	Constance						Birken-head	Cannell	1915	1916	374,270									



# GREAT BRITAIN.—Cruisers, &c.—continued.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse Power.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.			Armament.		Speed.	Fuel. Coal. Oil.	Complement (War).
												Belt.	Deck.	Gun Position.	Gunn.	Torpedo Tubes.			
P. L. Cr.	Effingham	9770	605	65	17	3 65,000	Portsmouth	Harland & Wolff, T.	1921	1925	2,138,999	in.	in.	7 7.5-in., 3 4-in. A.A., 4 3-pr., 2 2-pr.; 1 sub. 2 M.; 8 L.	(4 a.w., 1 sub. 4 a.w., 2 sub.	30½	—	713	
P. L. Cr.	Frobisher	9860	605	65	17	3 65,000	Devonport	Wallsend Eng. Co. T.	1920	1924	2,035,915†	3	—	[Frobisher, 4 4-in. A.A.]	4 a.w., 2 sub.	30½	2150	715	
P. L. Cr.	Enterprise	7580	570	54	9	16	Clydebank	John Brown	1919	1926	1,690,658*	3-1½	—	7 6-in., 3 4-in. A.A., 4 3-pr., 2 2-pr. Pom Poms; 2 M.; 8 L., 1 aircraft.	16 21*	33	1700	577	
P. L. Cr.	Emerald	7550	570	54	7	16	Elswick	T. (G.) Armstrong T. (G.)	1920	1926	1,474,235*	1	—	—	—	—	—	—	—
Cr.	Exeter	8390	575	58	0	17	0 80,000	Devonport	Parsons	1929	1931	1,837,415*	..	..	6 8-in., 4 4-in. A.A., 4 3-pr., 2 2-pr., 4 M., 8 L., 1 aircraft.	6 21*	32	1900	..
P. L. Cr.	Hawkins	9800	605	65	1	17	3 55,000	Chatham	Parsons Co. T. (G.)	1917	1919	1,599,741	3	—	7 7.5-in., 4 4-in. A.A., 4 3-pr., 2 2-pr. Pom Poms; 2 M., 8 L.	4 a.w., 2 sub.	29½	2680	747
Cr.	Kent	9850	630	68	4	16	8 80,000	Chatham	Hawthorn Leslie	1926	1928	2,128,950†	..	..	8 8-in., 4 4-in. A.A., 4 3-pr., 4 2-pr., 4 M., 8 L.	8	31½	3200	685
Cr.	London	9750	630	66	0	17	0 80,000	Portsmouth	Fairfield P. T.	1927	1929	2,029,949*	..	..	—	8	32½	3200	685
Cr.	Norfolk	9850	633	66	0	17	0 80,000	Fairfield	Fairfield	1928	1930	2,141,961*	..	..	8 8-in., 4 4-in. A.A., 4 3-pr., 4 2-pr., 4 M., 8 L.	8 21"	32½	3200	685

Cr.	Shropshire	9730	683	66	0	17	0	80,000	Dalmuir	Beardmore	1928	1,941,950†	..	8 8-in., 4 4-in. A.A., 4 3-pr., 4 2-pr., 4 m., 8 L.	8 21"	32½	— 3200	685
Cr.	Sussex	9730	630	66	0	17	0	80,000	Hawthorn Leslie	Hawthorn Leslie	1928	1,975,800†	..	8 8-in., 4 4-in. A.A., 4 3-pr., 4 2-pr., 4 m., 8 L.	8 21"	31½	— 3200	686
Cr.	Suffolk	9800	630	68	4	16	3	80,000	Portsmouth	Parsons	1926	2,180,240†	..	8 8-in., 4 4-in. A.A., 4 3-pr., 4 2-pr., 4 m., 8 L.	8 21"	30	800 1420	720
P. L. Cr.	Vindictive	9996	605	65	1	17	3	60,000	Belfast	Harland & Wolff, T. (G.)	1918	1,671,712	3	6 7.5-in., 3 4-in. A.A., 4 3-pr., 2 2-pr. Pom 2 sub. Poms; 2 m., 8 L.	8 21"	32½	— 1900	683
Cr.	York	8250	575	57	0	17	0	80,000	Palmers' (G.)	Palmers'	1928	1,774,276	..	6 8-in., 4 4-in. A.A., 4 3-pr., 2 2-pr., 4 m., 8 L.	8 21"	32½	— 1900	683

\* Total estimated cost of ship, including guns.

† Estimated cost, excluding armament and ordinance stores.

Two "Leander" Class cruisers and one "Arethusa" class cruiser (1932 programme) are authorised for commencement in 1933.

Patrol Boats.—P.C. 74, Dart (1918), 610 tons, 20 knots, 1 4-in., 2 12-pr.; P.59 (1917), P.40 (1916), Spey (1917), 560 tons, 20 knots, 1 4-in., 1 2-pr.

Training Ships and Guntery Drill Ships (ex-Monitors).—Erebus, 7,200 tons; Terror, 7,200 tons; Marshal Soult, 6,400 tons.

Fishery Protection Gunboats (ex-trawlers).—Colne, Doon, Dee, Garry, Kennet, Liffey, 490-550 tons.

Destroyer Depot Ships.—Greenwich, Sandhurst. A destroyer depot ship is authorised under the 1932 programme.

Submarine Depot Ships.—Lucia, Titania, Alecot, Adamant, Dolphin, Cyclops. Medway, built at Vickers', completed 1929, displacement 14,650 tons, speed 15 knots, armament 2 4-in., 4 4-in. A.A. One more (Maidstone) was authorised for commencement under the 1928-29 Estimates, but construction was cancelled in 1929.

Repair Ships.—Assistance. Resource, built at Messrs. Vickers; completed 1930, displacement 18,500 tons, speed 15 knots, armament 4 4-in. A.A.

Minelayers.—Medea, Medusa, Melpomene, Minerva, Vernon, Kate Lewis.

Surveying Vessels.—Beaufort, Fitzroy, Flinders, Kellett, Herald, Ormonde, Iroquois, Endeavour, Challenger (completed Chatham, 1931—originally intended as a fishery investigation vessel).

Special Service Vessel.—Triad (purchased 1915), 2,354 tons, 14 knots, 4 3-pdr. guns.

Nettlaying Vessel.—Guardian (Chatham, 1931-2), 3,050 tons, 6,500 H.P., 18 knots, 2 4-in. A.A.

Mining School Tender.—Nightingale (Portsmouth, 1931), displacement 275 tons, horse-power 400, speed 10 knots, coal capacity 15 tons. Skylark, similar, ordered at Portsmouth in February, 1932.

Boom Defence Vessels.—Moorgate (1931), 260 tons, 1 4-in. gun. Bishopsgate (1932). Another authorised, 1932 programme.

Guntery Training Ship.—Battleship Iron Duke has been de-militarised under the London Treaty and converted to a Guntery Training Ship.

Fleet Target Ship.—Centurion (ex-battleship), 23,000 tons.



# Defence Forces of the Dominions.

## ROYAL AUSTRALIAN NAVY.

Class.	NAME.	Standard Displacement.		Length. (Extreme.)		Beam. (Extreme.)		Draught.	Horse-Power.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Coal. Tons.	Complement (War).
		tons.	ft.	ft.	ft.	ft.	ft.								Belt.	Deck.	Guns.	Torped. Tubes.			
Cr.	Australia.	9870	630	68	4	16	3	80,000	Brown	Brown	Brown	1927	1928	£	in.	..	8 8-in., 4 4-in. A.A., 4 3-pr., 4 2-pr. 4 M., 12 L.	8 21" A.W.	31½	—	685
"	Canberra.	9850	630	68	4	16	3	80,000	Clydebank	Sydney	Sydney	1918	1922	..	..	..	9 6-in., 4 3-pr., 2 M., 1 3-in. A.A., 10 L.	2 (sub.) 21"	25.5	951	450
L. Cr.	Adelaide.	5100	462½	50	1	15	10	25,000	Sydney	Sydney	Sydney	1915	1916	..	3	—	8 6-in., 4 3-pr., 2 M., 1 3-in. A.A., 8 L.	2 (sub.) 21"	25.5	1196	490
L. Cr.	Brisbane.	5120	457	49	10	15	9	25,000	Sydney	Sydney	Vickers T.	1928	1929	..	—	—	4 4.7-in. A.A., 4 2-pr. Pom Pom, 4 3-pr. 4 M., 10 L., 6 sea-planes	21"	21	260	350
Scaplane Carrier	Albatross.	4800	443½	61	0	15	6	12,000	Cockatoo Island	Dumbar.	Denny T.	1917	1917	—	—	—	4 4-in. Q.F., 2 2-pr. A.A., 1 M., 4 L.	4	34	515	146
Flot. Ldr.	Anzac.	1310	327½	31	10	11	136,000	Dumbar.	Dumbar.	Dumbar.	Denny T.	1917	1917	—	—	—	—	—	34	515	Oil

DESTROYERS.—"S" Class :—Stalwart, Success, Swordsman, Tasmania, Tattoo. Completed, 1919; Displacement, 905 tons; 27,000 H.P.; speed, 36 knots; armament, three 4-in., one 2-pdr., 2 double torpedo tubes.

SLOOP.—"Flower" Class :—Marguerite, Geranium (1916), 1,175 tons; speed, 16.5 knots; armament, 1 4-in., 2 3-pr.; Mallow (1915), 1,165 tons, 16.5 knots, 1 12-pr., 1 3-pr. A.A. Surveying vessel Moresby (late Silvio) 1050 tons, length 267½ ft., 2,500 H.P., 17 knots, one 3-pr.

Submarine depot and fleet repair ship: Penguin (late Platypus). Displacement 3,450 tons, 14 knots, 1 4-in.; completed 1917.

### NEW ZEALAND NAVY.

**LIGHT CRUISERS**.—"D" *Class*.—Dunedin; completed, 1919 (Elswick). *Diomedé*; completed 1922 (Vickers). Displacement, 4,850 tons; 40,000 H.P.; speed, 29 knots; armament, 6 6-in., 8 4-in. A.A., 4 3-pr., 2 2-pr. Pom Poms, 2 M., 4 triple torpedo tubes; max. fuel, 1,050 tons oil; complement, 450.

### ROYAL CANADIAN NAVY.

**DESTROYERS**.—Champlain and Vancouver. Completed, 1919 (Thornycroft). Displacement, 905 tons; 29,000 H.P.; speed, 36 knots; armament, 3 4-in., 1 2-pr., 4 21-in. tubes; oil, 305 tons (radius of action, 2,000 at 15 knots). Saguenay and Skeena completed at Thornycroft's in 1931; displacement, 1330 tons; 32,000 H.P.; speed, 35 knots; armament, 4 4.7-in., 2 2-pr., 2 quad. torpedo tubes.

### SOUTH AFRICA.

**SURVEYING SHIP**.—"Beaufort" *Class*.—Protea (ex-Crozier). Twin-screw mine-sweeper, converted 1919. Displacement, 710 tons; 2,200 H.P.; speed, 16 knots; coal capacity, 185 tons; armament, one 3-pr. Transferred to South Africa, September, 1921.

### ROYAL INDIAN MARINE.

**MINESWEEPING SLOOP**.—Clive, 2,021 tons; 1,700 H.P.; 14½ knots; 2 4-in., 2 12-pdr., 4 3-pdr. guns; launched Beardmore, 1919. Lawrence, 1,250 tons; 1,900 H.P.; 15 knots; 2 4-in., 2 12-pdr., 4 3-pdr. guns; launched Beardmore, 1919.

**SLOOP**.—Cornwallis, 1,350 tons; 16½ knots; 2,500 H.P.; 8 4-in., 2 12-pdr., 4 3-pdr. guns (launched Hamilton, 1917, as the Lychnis). Hindustan, Swan Hunter (1930). Displacement, 1,190 tons; 2,000 H.P.; speed 16 knots; 2 4-in. guns.

**SURVEYING SHIPS**.—Investigator, 1,172 tons; 1,550 H.P.; no guns. Palinurus, 444 tons; 475 H.P.; no guns. Both completed 1907.

**PATROL BOATS**.—Baluchi, 682 tons; Pathan, 695 tons; both 3,500 H.P., and 1 4-in. and 2 12-pdr. guns; completed, 1917 and 1918.

## ARGENTINE REPUBLIC.

Class.	NAME.	Standard Displacement.	Length. (Extreme).	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.				Armament.		Speed.	Fuel. Coal. Oil.	Complement.	
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Gun. Second. Art.	Guns.				Torpedo Tubes.
c.	Almirante Brown	6495	545½	58	15½	85,000	{ Leghorn { Genoa .	{ 1929 1931		£ 1,250,000	in.	in.	in.	in.	in.	6 7½-in., 12 4-in. A.A., 6 Pom Poms, 1 catapult, 2 seaplanes.	6 21"	knots. 32	— tons. 2000	600
c.d.s.	General Belgrano†	6840	328	59½	24	13,000	Leghorn	1897 1899		696,700	6-3 H.S.	1½	6 H.S.	6 H.S.	6 H.S.	2 10-in., 8 6-in., 4 6-pr.	..	20-1 ½	..	515
c.d.s.	General San Martín†	6773	328	59½	24	13,000	Leghorn	1896 1898		688,200	6-3 H.S.	1½	6 H.S.	6 H.S.	6 H.S.	4 8-in., 6 4 7-in.	..	19-8	..	431
b.	{ Moreno . { Rivadavia .	27,940	585	95½	28	45,000	{ Camden, N.J. { (N.Y.S.B.Co.) { Quincy, Mass.	{ 1911 1915 { 1911 1914		2,200,000	12-10 3-2 K.S.	9-6 K.S.	9-6 K.S.	9 K.S.	6 12-9 K.S.	12 12-in., 12 6-in., 4 3-in. A.A., 4 3-pr.; 6 M., 4 L.	2 (sub.) 21"	22-5	— 4200	1046
c.d.s.	Pueyrredon † .	6840	328	59½	24	13,000 B.	Sestri Ponente	1898 1901		782,000	6-3 H.S.	1½	6 H.S.	5 H.S.	6 H.S.	2 10-in., 8 6-in., 4 6-pr.	..	20-1 ½	..	430

Moreno and Rivadavia were converted to oil burning and fitted with geared turbines in 1925.

The old coast-defence ironclads Libertad and Independencia, 2800 tons, completed at Birkenhead in 1892-93, and converted to oil fuel in 1927, carry two 9-4-in., four 4-7-in., and six 3-pr. guns. The Libertad is unserviceable at present, but is being refitted.

Cruiser Buenos Aires (Elswick, 1895), 4780 tons, four 6-in., six 4-7-in., twelve 3-prs., 13,000 H.P., 23-2 knots on trial. River gunboats Paraná and Rosario (Elswick, 1909), 1055 tons, two 6-in. howitzers, six 12-pr., 8 M., 2 L., 15 knots.

The training-ship (cruiser) (Birkenhead, 1896), Presidente Sarmiento, 2850 tons, 15 knots; two 4-7-in., two 4-in., four 6-pr., two 3-pr. There are 3 minelayers, 11 transports and many auxiliaries.

Two sloops (surveying vessels), San Juan and San Luis (Hawthorn Leslie, Newcastle, 1928), 790 tons, 1-3", 12 knots.

Two tugs, Mataco, Toba completed 1928, at Messrs. Hawthorn Leslie's, Newcastle, and 11 others.

One cruiser, three sloops, two transports and four coastguard vessels are projected.

† Converted to oil burning and armament altered in 1929.

# BRAZIL.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draft.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Coal.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkheads.	Heavy Guns.	Gun Position.	Torpedo Tubes.				
a.d.s., t.	Florianópolis	8102 tons.	267½ p.p.	48	18½	3400 D'A.	La Seyne	1899	1901	..	18½ ft. H.S.	1½	..	..	8 H.S.	3 H.S.	2 9.4-in., 4 4.7-in., 2 M., 4 6-pr., 2 1-pr.	2 (sub.)	236 tons.	260	
b.	Minas Geraes	19,281	543	83	25	27,212 B.&W.	Elswick	1908	1909	1,821,400	9-6-4 H.S.	2	9-6-4 H.S.	9	12-8 H.S.	9	12 12-in., 22 4.7-in., 8 8-pr., 2 3-in. A.A.; 4 M.	—	21.5 knots.	2380	850
b.	São Paulo	19,281	543	83	25	28,645 B.&W.	Barrow	1909	1910	1,821,400	9-6-4 H.S.	2	9-6-4 H.S.	9	12-8 H.S.	9	12 12-in., 22 4.7-in., 8 8-pr., 2 3-in. A.A.; 4 M.	—	21.5 knots.	2380	850

**LIGHT CRUISERS:**—Bahia and Rio Grande do Sul, completed at Elswick, 1910, reconstructed, including conversion to oil fuel, at Rio de Janeiro, 1926, 3100 tons, ten 4.7-in., four 3-pr. guns, 2 twin torpedo tubes, 22,000 H.P., 27 knots.

**RIVER GUNBOATS:**—Missaes, 200 tons, 11 knots; Oyapock, 195 tons, 14 knots.

**GUNBOATS:**—Almirante Bastos dos Reis and Almirante Brasil; ordered in 1931.

**MINELAYERS:**—Maria do Couto, Carneiro da Cunha, Heitor Perdigão and Muniz Freire.

**RIVER MONITOR:**—Pernambuco, 470 tons, 11 knots, built at Rio de Janeiro.

**GUNBOAT SCOUT:**—Victoria (ex-Espírito Santo), 470 tons.

**SUBMARINE TENDER:**—Caara (Spezia, 1916), 4000 tons, 4100 H.P., 14 knots, four 4-in. guns.

**ARMED TRANSPORT:**—Belmont (ex-German SS. Valesia), 5227 tons gross.

A training ship is projected.

A decree signed on June 11, 1932, established a credit of 480,000 contos (about £10,000,000), spread over 12 years for renewing the Brazilian Navy. Details of the programme are not yet settled.

## CHILE.—Armoured Ships.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Cost.	Armour.					Armament.		Speed.	Fuel.	
										Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Second-ary.	Guns.		Torpedo Tubes.	tons.
b.	Almirante Latorre * (ex-Canada)	33,200 651	ft. 92	ft. ins. 629 0	37,000	Elswick.	1913	1915	£ ..	in. 9-4	in. 4-2½	in. 4½	in. ..	in. 10	in. 6	10 14-in., 14 6-in., 2 3-in., A.A., 4 3-pr., 1 catapult.	4 (sub.) 21'	knots. 23	Oil. 1000
a.c.	General O'Higgins	8,500 412	62	9 22	0 16,000	Elswick.	1897	1898	..	7-5	2	..	..	7½-6	6	4 8-in., 10 6-in., 12 3-in., 4 M.	..	21·5	1200 500
b.	Capitan Prat †	7,287 328	p.p. 60	9 22	9 12,000	La Seyne	1890	1893	391,000	12	3	4	..	10½	2	4 9-4-in. (Canet), 8 4-7-in. (Canet), 8 6-pr., 11 M.	2	18	775 500

\* Fitted with bulges, converted to oil burning, and modernised in England (completed 1931).

† Submarine parent ship.

## Cruising Ships.

Class	NAME	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Torpedo Tubes.	Speed.	Coal.	Complemen.
											Deck.	Gun Position.				
cr.	Blanco Encalada	tons. 4400	ft. ins. 370 46 6	ft. ins. 19 6 14	5000	Elswick.	1893	1894	..	..	in. 4-1½	in. ..	2	knots. 22·78	tons. 850	385
"	Chacabuco	4500	360 p.p.	46 6 17	0 15,500	Elswick.	1901	1903	..	..	4½-1½	..	2	24·0	1000	400
													(sub.)			

OILERS (Armstrongs, 1930): Maipo, 4,686 tons gross; Itacangua, 3,080 tons displacement. Coastguard vessels: Orompello, Loncoton, Elieura, Colocolo, 580 tons; Aguilu, 820 tons; Forvenir, 450 tons. Submarine depot ship: Araucano (Vickers-Armstrongs, Barrow), completed 1980; displacement 6,500 tons; armament two 4·7-in.; length b.p. 390 ft.; beam 55 ft.; draught 16 ft. 6 ins.; speed 13 knots; H.P. 2,500. Two cruisers are projected.

TRAINING SHIP.—(General Baquedano.

## DENMARK.—Armoured Ships.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draft.	Horse Power.	Where Built.	Date of Launch.	Date of Completion.	Coal.	Armour.				Armament.		Speed.		Fuel.	
											Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Gun Position.	Torpedo Tubes.	knots.	Coal.	Oil.
a.c.	Niels Juel	tons. ft. ins. ft. ins.	3400 295 453 6 15 9	5500			Copenhagen	1918	1923	£	in. ft. ins.	2	in.	in.	..	2	2	17.0	240	309
											8-4 K.S.		..	..	..	K.S.	(sub.)		250	
s.d.s., t.	Olfert Fischer	3415 283 9 50 6 16 9	4600				Copenhagen	1903	1905	..	7-4 K.S.	3	..	..	7	6	3	16.0	250	256
											8-4 K.S.	2	..	..	7	6	4	16.0	250	262
s.d.s., t.	Peder Skram	3515 286 7 51 6 16 3	5400				Copenhagen	1908	1909	..	8-4 K.S.		..	..	7	6	(sub.)		250	

Mine-layers : Lossen, 600 tons, 13 knots, 175 mines ; Minckran v and vi, 186 tons, 8 knots, 60 mines ; Mining boats 1-10. Greensund, torpedo boat repair ship ; Hekla, submarine depot ship. Submarine depot and repair ship Henrik Gerner completed 1928, displacement 490 tons, 900 H.P., 13 knots, carries two 3-in. guns. Fishery inspection vessels : Aegir, Odin, Thor (Iceland Government), Hvidjörnen, Diana, Fenris, Island Falk, Fylla (ex-British sloop Asphodel).

Surveying vessels Marstrand and Willemoes, 158 tons, 11 knots.

Six minesweepers (ex-Torpedo boats \*), 96 tons. Fire patrol vessels (ex-Torpedo boats \*), 96 tons.

\* See Fleet Tables.



## FRANCE.—Battleships and Armoured Cruisers.

Class	NAME. DATE FOR SCRAPPING UNDER WASHINGTON TREATY.	Standard Displacement.	Length. (Extreme).	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Cost.	Armour.				Armament.		Speed.	Fuel. Coal. Oil.	Complement.
										Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Second ary.			
b.	Bretagne 1934	{ 22,189 544 23,128*	688 629	11 84	7 27	0 29,000 N. tur.	Brest	1913	2,589,439	11-7 24-13 K.S.	7 10 1/2 K.S.	7 10 1/2 K.S.	7 10 1/2 K.S.	10 13-4-in., 18 5-5-in., 4 3-in. A.A., 5 8-pr., 2 1-pr., 2 L.	4 20-0 (sub.) 18"	2700 1167 300		
b.	Condorcet	{ 17,597 480 18,592*	688 629	11 84	7 27	0 22,500 St. Nazaire N. tur.		1909	2,165,200	10-8 K.S.	2 1/2 8 1/2 K.S.	12 K.S.	12 K.S.	4 12-in., 12 9-4-in., 12 3-in., 2 3-in. A.A., 4 3-pr. A.A., 2 1-pr., 2 L.	2 19-25 2100 890 (sub.)	—		
b.	Courbet. 1930	{ 22,189 544 23,128*	688 629	11 84	7 27	0 28,000 Lorient N. tur.		1911	2,508,388	11-7 23-13 K.S.	7 10 1/2 K.S.	7 10 1/2 K.S.	7 10 1/2 K.S.	12 12-in., 22 5-5-in., 3 3-pr., 4 3-in. A.A., 2 1-pr., 2 L.	4 20-0 2450 1140 (sub.) 18"	250		
b.	Diderot	{ 17,597 480 18,592*	688 629	11 84	7 27	0 22,500 St. Nazaire N. tur.		1909	2,167,000	10-8 K.S.	2 1/2 8 1/2 K.S.	12 K.S.	12 K.S.	4 12-in., 12 9-4-in., 12 3-in., 2 3-1/2-in. A.A., 2 3-pr. A.A., 2 1-pr., 2 L.	2 19-25 2100 890 (sub.) 18"	—		
a.c.	Ernest Renan	{ 12,231 521 13,500*	770 027	637 500 St. Nazaire Nic., t		1906		1909	1,410,000	63-4 H.S.	2 5-8 H.S.	4 1/2 H.S.	6 H.S.	5 47-6-in., 12 6-5-in., 2 3-in. A.A., 4 3-in., 8 9-pr., 2 1-pr.	2 24-4 1870 874 (sub.) 6"	—		
b.	Jean Bart 1930	{ 22,189 544 23,128*	688 629	11 84	7 27	0 28,000 Brest B. tur.		1911	2,528,388	11-7 23-13 K.S.	7 10 1/2 K.S.	7 10 1/2 K.S.	7 10 1/2 K.S.	12 12-in., 22 5-5-in., 4 3-pr., 4 3-in. A.A., 2 1-pr., 2 L.	4 20-0 2450 1140 (sub.) 18"	250		
a.c.	Jules Michelet	{ 11,072 489 12,400*	0 70 327	0 29,000 Lorient Guyot		1905		1908	1,204,107	6-4 K.S.	2 5-3 K.S.	6 8 H.S.	8 K.S.	5 47-6-in., 12 6-5-in., 2 3-in. A.A., 10 3-pr., 2 M.	2 22-0 1870 724 (sub.)	—		

<i>b.</i>	<b>Lorraine</b> 1936	{ 22,189 544 688 6 29 0 29,000 St. Nazaire 1913 1916 2,642,439 11-7 23-13 23,128* tur. s. & cyl.	7	7	10½	7	10½	7	10 13-4-in., 18 5-5-in., 4 3-in. A.A., 5 3-pr., 2 1-pr., 2 L.	4 (sub.) 18"	4	20-0	..	1167
<i>b.</i>	<b>Paris</b> 1934	{ 22,189 544 688 6 29 0 28,000 La Seyne . 1912 1914 2,603,920 11-7 23-13 23,128* N. tur.	7	7	10½	7	10½	7	12 12-in., 22 5-5-in., 4 3-pr., 4 3-in. A.A., 2 1-pr., 2 L.	4 (sub.) 18"	4	20-0	2450 250	1140
<i>b.</i>	<b>Provence</b> 1935	{ 22,189 544 688 6 29 0 29,000 Lorient . 1913 1915 2,589,000 11 7 23-13 23,128* tur.	7	7	10½	7	10½	7	10 13-4-in., 18 5-5-in., 4 3-in. A.A., 5 3-pr., 2 1-pr., 2 L.	4 (sub.) 18"	4	20-0	2700 300	1167
<i>b.</i>	<b>Voltaire.</b>	{ 17,597 480 1184 7 27 0 22,500 La Seyne . 1909 1911 2,169,200 10-8 23 18,592* B. tur.	8½	..	12	8½	12	8½	4 12-in., 12 9-4-in., 12 3-in., 2 3-in. A.A., 2 3-pr., 2 1-pr., 2 L.	2 (sub.)	2	19-25	2100	890
<i>a.c.</i>	<b>Waldeck- Rousseau .</b>	{ 12,617 521 470 7 27 6 55,286 Lorient . 1908 1911 1,301,380 6½-3½ 13,828* Nic. t.	5	4½	6	5	4½	6	14 7-6-in., 10 3-in., 10 9-pr. A.A., 2 3-pr., 2 M.	2 (sub.)	2	23-0	1900	874

\* Displacement accepted at the Washington Treaty.

All the above battleships were reconstructed and modernised between 1923 and 1930.  
 Since 1930 all except Diderot, Condorcet and Voltaire have been taken in hand for conversion to oil-fuel burning.  
 A battleship, Dunkerque, is authorised. Will probably be built at Brest. Principal features reported to be:—26,500 tons displacement, 8 13-in. guns; about 30 knots speed.  
 A second is projected.

## Aircraft Carriers.

Class.	NAME.	Standard Displacement. tons.	Length. (Extreme) ft. ins.	Beam. ft. ins.	Draught. ft. ins.	Horse-power.	Where built.	Date of Launch.	Date of Completion.	Cost. £	Armour. Belt, deck.	Armour. Gun Position.	Armament. Guns. Torpedos, Tubes.	Speed. knots.	Fuel. Coal. Oil.	Complement.
A.C.	<b>Bearn *</b>	22,146	597 1	89 0	29 10	37,000	Chantiers de la Méditerranée, La Seyne	1920	1928	..	In. 3½	In. ..	8 6-1-in., 6 3-in. A.A., 8 1-pr. A.A., 12 M. A.A., 41 planes 21-7"	21-5	— 2070	875
A.T.	<b>Commandant Teste</b>	10,000	548 0	88 7	23 6	21,000	Chantiers de la Gironde, Bordeaux	1927	1931	..	2 1½	..	12 3-9-in. A.A., 8 1-pr. A.A., 12 M., 20 planes, 4 catapults, 5 cranes.	20-5	oil	648

\* Originally designed as a battleship.



## FRANCE.—Cruisers.

(See pages 252-3 for the armoured cruisers Ernest Renan, Jules Michelet and Waldeck-Rousseau.)

Class.	NAME.	Standard Displacement. tons.	Length. (Extreme). ft. ins.	Beam. ft. ins.	Draft. ft. ins.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost. £	Armour.		Armament.		Speed. knots.	Fuel. Coal. Oil.	Complement.
											Belt.	Gun Position.	Guns.	Torpedo Tubes.			
training cruiser	Jeanne d'Arc	649	557 8	58 0	18 8	32,000	Penhoet Yard, St. Nazaire	1930	1931	2	in.	in.	8 6-in., 4 3-in. A.A., 2 1.6-in., 2 m., 2 scaplanes 21.7" 2 catapults	2	26	tons.	506
cr.	Jean-de-Vienne	7600	590 0	57 5	16 5	80,000	Lorient.	Bldg.	Bldg.	..	..	..	9 6-in.	..	..	..	..
"	La Galissonnière	10,000	607 0	63 0	17 8	84,000	Brest	1932	Bldg.	1,980,000	about 6	..	8 8-in., 12 3.9-in. A.A., 8 1.5-in., 16 m., 2 catapulta	2	32	oil	746
"	Dupleix	10,000	607 0	63 0	20 7	90,000	Brest	1930	1932	1,570,000	..	..	8 8.5-in., 8 3.5-in. A.A., 8 1-pr. A.A., 12 m., 3 scaplanes, 2 catapults.	2	32	oil	605
"	Foch	10,000	607 0	63 0	20 7	90,000	Brest	1929	1930	1,450,000	..	..	8 8-in., 8 3-in. A.A., 8 1-pr. A.A., 12 m., 3 scaplanes, 2 catapults	2	33	—	605
"	Colbert	10,000	607 0	63 0	20 7	90,000	Brest	1927	1929	1,270,000	..	..	8 8-in., 8 3-in. A.A., 8 1-pr. A.A., 12 m., 3 scaplanes, 2 catapults	2	33.2	1800	590
"	Suffren	10,000	626 8	62 4	20 7	120,000	Lorient.	1926	1928	..	..	..	8 8-in., 8 3-in. A.A., 8 1-pr., 2 scaplanes	2	33.2	—	590
"	Tourville	10,000	626 8	62 4	20 7	120,000	Brest	1925	1926	..	..	..	8 8-in., 8 3-in. A.A., 8 1-pr., 2 scaplanes	2	33.2	—	590
"	Duquesne	10,000	626 8	62 4	20 7	120,000	Lorient.	1925	1926	..	..	..	8 8-in., 8 3-in. A.A., 8 1-pr., 2 scaplanes	2	33.2	—	590
"	Duguay-Trouin	7249	594 10	56 6	17 0	110,000	Brest	1923	1926	..	..	..	8 6.1-in., 4 3-in. A.A., 2 3-pr., 2 m., 1 L., 2 scaplanes, 21.7" 1 catapult	4	33	—	574
"	Primauguet	7249	594 10	56 6	17 0	110,000	Brest	1924	1926	..	..	..	8 6.1-in., 4 3-in. A.A., 2 3-pr., 2 m., 1 L., 2 scaplanes, 21.7" 1 catapult	4	33	—	574
"	La Motte Picquet	5265	496 11	47 0	16 6	36,400	Lorient	1924	1926	..	..	..	8 6.1-in., 4 3-in. A.A., 2 3-pr., 2 m., 1 L., 2 scaplanes, 21.7" 1 catapult	4	33	—	574
"	Metz (ex-Königsberg)	5265	496 11	47 0	16 6	36,400	Bremen (Weese)	1915	1916	..	24	1	8 5.9-in., 2 3-in. A.A., 4 m. 2aub. 200 mines	4	27	1270	433

"	Mulhouse ( <i>ex-Stralsund</i> )	4527	455	0	44	0	16	9	30,000 (tur.)	Bremen(Weser)	1912	1913	416,340	4-2½	2	7 5-9-in., 2 3-in. A.A., 2 M., 120 mines.	197 <sup>r</sup>	2	26-75	1200 130	454
"	Strasbourg ( <i>ex-Regensburg</i> )	4723	468	1	45	0	17	0	26,000 (P. tur.)	Bremen(Weser)	1914	1914	417,810	4-2½	2	7 5-9-in., 2 3-in. A.A., 4 M., 120 mines.	197 <sup>r</sup>	4	26-0	1200 380	438
"	Thionville ( <i>ex-Novara</i> )	2922	428	7	42	0	15	6	25,000 (tur.)	Fiume	1913	1914	..	2½	..	9 3-9-in., 2 3-in. A.A., 1 M.	2 twin	2	27-0	800 —	430
M.Cr.	Emilie Berlin	5886	..	..	..	..	..	..	102,000	Lorient	1932	Bldg.	..	..	..	9 6-in., 4 3-5-in. 250 M.	6	34-0	..	..	
"	Pluton	4773	472	0	50	0	17	0	57,000	Lorient	1929	1931	..	..	..	4 5-5-in., 10 1-pr., 12 M., 1000 mines.	..	30 0	..	..	

Four 7,600 cruisers are authorised (1932 programme), Marseillaise, Gloire, Montcalm, and Chateaurenault.

RIVER GUNBOAT.—Francis Garnier (1929), 750 tons, 15 knots, two 4-in., one 3-in. A.A. GUNBOAT.—Jouffroy d'Abbans, 400 tons, 15 knots, 2-3 in., building.

MINESWEEPERS.—Vaillante, Conquerante (1918), 424 tons, 17 knots, two 3-9-in.; Luronne (1917), 295 tons, 13-8 knots, two 3-9-in.; Impéteuse, Batailleuse, Audacieuse (1917), 348 tons, 15 knots, two 3-9-in.; Eveillé, Engageante (1917), 360 tons, 17 knots, two 3-9-in.; Agile, Inconstant Ardent (1916), 354 tons, 17 knots, two 3-9-in.; Sans-Souci, Etourdi, Alerte, (1916), 354 tons, 17 knots, two 3-9-in.; Gracieuse, Capricieuse, Dédaigneuse, Malicieuse, Topagouse, Surveillante (1916), 348 tons, 15 knots, two 3-9-in.; Granit, Mica, Porphyre, Meulière, Quartz (1918), 391 tons, 12-5 knots, one 9-pr.

MINELAYERS.—Castor, 3,150 tons, three 3-9-in., two 1-5 A.A.; Pollux, 2,460 tons, completed 1930.

SUBMARINE PARENT SHIP.—Jules Verne (1931), 5,747 tons, 7,000 H.P. (Diesel), 16 knots, mounting four 3-5-in. A.A., four 1-pdr. A.A.

SLOOPERS.—Bouguinville, Dumont Durville, Savargnan de Brazza, and d'Entrecasteaux, building, 1970 tons, 3,200 H.P. (Diesel), 15-5 knots, armament three 5-1-in., four 1-pr. A.A.; 6 M., 1 scaplane. Rigault-de-Genouilly and Amiral Charner, building (1930 pr.), D'Iberville (1931 pr.), authorised. Ville d'Ys, completed 1917, 1,378 tons, 17-5 knots, mounting three 3-9-in., three 3-in., two 3-pr., 2 M.; Régulus, completed 1917, 1,378 tons, 17 knots, mounting two 5-5-in., two 3-in. A.A., 2 M.; Antares, Aldchaban, Bellatrix, Algol, Alkair, completed 1916, 1378 tons, 17 knots, mounting two 5-5-in., two 3-in. A.A., 2 M.

DESPATCH VESSELS.—Du Couedic, Enseigne Henry, Duperré, Duclaffault, Dubourdien, 1919-1920, 512 tons, 17 knots, one 5-5-in., one 3-9-in.; Moudonmont, Montmirail, Remicmont, Baccarat, Bethune, Virry-le-Francois, Lievin, Calais, Lassigny, Les Esparges, Vanquois, Vimy, Craonne, Dunkerque, Epinal, Nancy, Coucy, Laffaux, Amiens, Toul, Tahure, Arras, Bapaume, Reims, Peronne, Luneville, 1919-1924, 748 tons, 20 knots, two 5-5-in., one 3-in. A.A.; Escaut, Ailette, Ancre, Scarpe, Snippe, Meuse, Yser, Somme, Oise, Marne, Quentin-Roosevelt, 1917-1919, 570-694 tons, 21 knots, four 3-9-in.

A NET-LAYER, Le Gladiateur, is being built at Lorient, 2,300 tons, 387 feet long, 7,700 H.P., 20 knots. A second is projected.

ESCORTERS.—(1931 pr.) Bayonnaise, Cordelière, Incomprise, Malpomene, Flore, Pomone, and Iphigénie, all building. (1932 pr.) Branle-Bas, Bombarde, Boucher, Batiste, authorised.

SURVEYING SHIP.—Amiral Monchev, 800 tons, 12 knots, building.

## GERMANY.—Battleships.

Class.	NAME.	Displacement.	Length. (Extreme).	Beam.		Draught.	Horse-Power.	Where Built.	Date of Launch.	Cost.	Armour.				Armament.		Speed.	Coal. Oil.	Complement.
				ft. ins.	ft. ins.						Belt.	Deck above Belt.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Second- ary.			
b.	Deutschland *	10,000 (standard)	590	67	619	0	54,000 Diesel	Deutsche Werke, Kiel	1931	£ 3,750,000	in. about 5	in.	in.	in.	6 11-in., 8 5/9-in., 4 3-in. A.A.	6 (a.w.) 1977	26	— 1200	634
b.	Ersatz Lothringen	10,000 (standard)	—	—	—	—	—	Wilhelms- haven	—	Bldg. 3,530,000	—	—	—	—	—	—	—	—	—
b.	Ersatz Braun- schweig	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
b.	Hannover †	12,991	413	172	1025	3	17,768 T.S. t.	Wilhelms- haven	1905	1,157,500	9 1/4 K.S.	3	8 K.S.	6 10-6 K.S.	4 11-in., 14 6 7/8-in., 4 3 5/8-in., 4 3 5/8-in. A.A., 23 M.	4 (a.w.)	18.5 t	1771 197	727
b.	Hessen	12,991	413	572	1025	3	16,000 T.S. & C.	Kiel (Ger- mania)	1903	1,157,500	9-4 K.S.	3	6 K.S.	6 10-6 K.S.	4 11-in., 14 6 7/8-in., 4 3 5/8- in., 4 3 5/8-in. A.A.	4 (a.w.)	18.0	1574 197	727
b.	Schlesien †	12,991	413	172	1025	3	17,000	Schichau } Germania }	1906	1,214,000	9 1/4 K.S.	3	8 K.S.	6 11-6 K.S.	4 11-in., 14 5 9/16-in., 4 3 5/8- in., 4 3 5/8-in. A.A. (Schlesien 2 3 5/8-in. A.A.)	4 (a.w.)	18	1771 197	727
b.	Schleswig- Holstein †	12,991	413	172	1025	3	17,000	Schichau } Germania }	1906	1,214,000	9 1/4 K.S.	3	8 K.S.	6 11-6 K.S.	4 11-in., 14 5 9/16-in., 4 3 5/8- in., 4 3 5/8-in. A.A. (Schlesien 2 3 5/8-in. A.A.)	4 (a.w.)	18	1771 197	727

\* Formerly known as Ersatz Preussen.

† Reconstructed 1925-30.

A fourth armoured ship, Ersatz Elsass, is projected, but no money is yet voted.

## GERMANY.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.	Armament.	Speed.	Fuel.	Complement.	
		tons.	ft. ins.	ft. ins.	ft. ins.						£	Belt.	Gun.	Torpedo Tubes.	tons. — Coal. Oil.		
<i>L.c.</i>	Leipzig	6000	548 10	53 5	15 7	72,000 (turbine Diesel)	Wilhelmshaven	..	1929	1932	2,100,000 (estimated)	in. 3-4	9 5-9-in. A.A.	4 triple 19-7-in.	32 knots.	— 1500	534
<i>L.c.</i>	Köln	6000	570 10	49 10	17 8	65,000 { 12,000 Diesel	Wilhelmshaven	..	1928	1930	..	in. 3-4	9 5-9-in. A.A.	4 triple 19-7-in.	32 knots.	— 1200	500
<i>L.c.</i>	Karlsruhe						Deutsche Werke, Kiel	..	1927	1929	..						
<i>L.c.</i>	Königsberg						Wilhelmshaven	..	1927	1929	2,100,000						
<i>L.c.</i>	Emden	6000	510 2	46 11	17 4	46,500	Wilhelmshaven	..	1925	1925	..	..	8 5-9-in. A.A.	2 twin 19-7-in.	29	1100 700	483
<i>L.c.</i>	Berlin	3592	362 7	43 4	16 5	10,000	Danzig	..	1903	1905	..	..	8 4-1-in.	2 19-7-in.	22	846	349

\* Employed as Training Ships.

GUNNERY TENDERS OR TRAINING SHIPS.—Drache (1908), 778 tons, 16 knots, 4 4-1-in.; Fuchs (1919), 517 tons, 16 knots, 2 3-4-in.; Hay (1907), 517 tons, 16 knots, 6 3-4-in.; Delfin, 517 tons, 16 knots. Gunery Tender Bremse (formerly known as Ersatz Drache), completed at Wilhelmshaven in 1932, 1,230 tons, 339½ feet long, 31 ft. 2 in. beam, 25,000 H.P. (Diesel), 27 knots, 4 4-1-in. guns. A second new Gunery Tender, Ersatz Hay, is authorised (to be laid down in 1936). Surveying vessel Meteor (1924), 1150 tons, and two surveying launches, 90 tons.

FISHERY PROTECTION VESSELS.—Weser and Elbe (Wilhelmshaven, 1931), 590 tons, 1600 H.P. (Diesel), 15 knots; Zieten (1919), 541 tons.

EXPERIMENTAL VESSELS.—Pelican, Nautilus (500 tons), Grille (470 tons).

MINESWEEPERS.—29 in number. 475-525 tons, 16 knots. Six are projected to commence in 1935.

TARGET SHIP.—Fähringen (ex-battleship), 11,800 tons. Wireless controlled. TARGET TUGS AND CONTROL SHIPS.—Pfeil and Blitz, 650 tons.

## GREECE.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draft.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.				Armament.		Speed.	Coal.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Gun Position.			
a.s.	Giorgios Averoff *	9301 tons.	462 ft.	69 ft.	24½ ft.	21,500 B. & L.	Leghorn (Orlando)	1910	1911	£ 1,100,000	8-3½ in.	1½ in.	7 in.	7 in.	8-6 in.	in.	4 9-2-in., 8 7-6-in., 16 3-in., 4 3-pr., 2 3-in. A.A., 2 M. 18-in.	3 knots. 24.0 1500 t.	..
cr.	Helle† (ex Fei-Hung)	2083 tons.	322 ft.	39 ft.	14 ft.	6000 tur.	Camden, N.J.	1912	1914	240,000	..	1½ in.	..	..	..	..	3 6-in., 1 3-in. A.A., 110 mines 18-in.	20 knots. 600 280 100	280

\* Retubed and refitted 1927.

† Repaired and converted to oil burning in Franco and fitted as a minelayer in 1929.

Old gunboat (gunnery school tender), Amvrakia, 470 tons. Training ship, Aros, 1,870 tons, 10 knots, four 3-in. guns, completed at Chantiers de la Méditerranée, la Seyne, 1929. Repair ship, Hepheastos, 4,549 tons gross, 11½ knots. Surveying ship, Nautilus, 400 tons. Dispatch vessels, Korgin Lenios (1916), 380 tons, and Kichle (1884), 86 tons.

## ITALY.—Battleships.

Class.	NAME. DATE FOR SCRAPPING UNDER WASHINGTON TREATY.	Displacement. tons.	Length. (extreme). ft.	Beam. ft.	Draught. ft.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.				Armament.		Speed. knots.	Fuel. Coal. Oil.	Complement
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy. Second- A.Y.	Guns.	Torpedo Tubes.		
b.	Andrea Doria 1937	21,555	575	9 92	0 29	24,000	Spezia .	1913 1916	..	£	10-4 K.S.	1½	6	..	9½ K.S.	13 12-in., 16 5-in., 13 8-in., 6 5-in. A.A., 2 2-pr., 6 M., 4 L.	2 (sub.) 18-in.	22	1480 1074
b.	Caio Duilio 1936	22,341†	575	9 92	0 29	P. tur. Y.	Castellammare	1913 1915	..	..	10-4 K.S.	1½	6	..	9½ K.S.	13 12-in., 16 5-in., 13 8-in., 6 5-in. A.A., 2 2-pr., 6 M., 4 L.	2 (sub.) 18-in.	22	1480 1074
b.	Conte di Cavour 1936	21,603	575	9 92	0 29	24,000	Spezia .	1911 1915	..	..	10-4½ K.S.	1½	6	..	9½ K.S.	13 12-in., 18 4-7-in., 13 8-in., 6 5-in. A.A., 2 2-pr., 2 M., 4 L., 1 catapult	2 (sub.) 18-in.	22	1480 1074
b.	Giulio Cesare 1935	21,816	575	9 92	0 29	24,000	Genoa (Ansaldo)	1911 1914	..	..	10-4½ K.S.	1½	6	..	9½ K.S.	13 12-in., 18 4-7-in., 13 8-in., 6 5-in. A.A., 2 2-pr., 2 M., 4 L., 1 catapult	2 (sub.) 18-in.	22	1430 1074
†	Pisa * .	8759	460 11	68 11	24½	19,000	Leghorn (Orlando)	1907 1909	..	..	8-3½ K.S.	1½	7	7	8-6 K.S.	4 10-in., 8 7-5-in., 12 5-in., 6 5-in. A.A., 2 3-pr., 4 M., 2 L.	2 (sub.) 18-in.	22-5	1486 687
†	San Giorgio	9232	462 2	69 0	24½	18,000	Castellammare	1908 1910	..	..	8-3½ K.S.	1½	7	7	7-6 K.S.	4 10-in., 8 7-5-in., 10 5-in., 6 5-in. A.A., 2 3-pr., 6 M., 2 L.	2 (sub.) 18-in.	22-5	1476 648
†	San Marco.	9350				20,000			..	..								23	1378 66

\* Caleds training ship.

† Load displacement accepted at the Washington Conference 1921-2.

‡ Armoured Cruisers, classified as Battleships, 2nd class, in Italian Official Lists.



## ITALY.—Cruisers, &amp;c.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draft.	Horse-power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.	Speed.	Fuel. Coal. Oil.	Complement.
											Side. Deck.	Gun Position.				
		tons.	ft. ins.	ft. ins.	ft.					£	in.	in.	Guns.	knots.	tons.	
cr.	Eugenio di Savoia	6,500	..	..	..	..	Ansaldo, Genoa	..	Bldg.	..	..	..	..	..	..	840
	Emmanuel Filiberto						Orlando, Leghorn									
	Pola	10,000	600 0	67 8	20 2	95,000	Orlando, Leghorn	1931	1932	..	Abt. 6	..	8 8-in., 16 3.9-in. A.A., 8 smlr., 1 catapult, 3 aircraft	32	..	..
"	Montecuccoli	5,857	..	..	..	95,000	Ansaldo, Genoa	1931	Bldg.	..	..	..	8 6-in., 6 3.9-in. A.A., 8 smaller	37	oil	..
	Muzio Attendolo															
"	Gorizia	10,000	590 9	67 9	20 2	95,000	Orlando, Leghorn	1930	1932	..	Abt. 6	..	8 8-in., 16 3.9-in. A.A., 12 smaller	32	oil	..
	Bolzano						Ansaldo, Genoa	1932	Bldg.	..	..	..	8 8-in., 16 3.9-in. A.A., 12 smaller	36	oil	..
"	Armando Diaz	5,009	559 0	51 0	14 5	95,000	Odero-Terni, Spezia	1930	1932	..	..	..	8 6-in., 6 3.9-in. A.A., 8 M., 1 catapult, 2 seaplanes	37	oil	..
	Luigi Cadorna						Stabilimento Tecnico Triestino, Trieste	1931								
"	Zara	10,000	599 5	67 8	20 2	95,000	Odero-Terni, Mugugno	1930	1931	..	4	—	8 8-in., 16 3.9-in. A.A., 12 smaller (Zara 8), 3 aircraft	32	2200	..
	Fiume						Stabilimento Tecnico Triestino, Trieste									
"	Alberto da Giussano	5,069	555 0	51 0	14 5	95,000	Ansaldo, Sestri-Ponente	1930	1931	..	..	..	8 6-in., 6 3.9-in. A.A., 6 M., 1 catapult, 2 seaplanes	37	oil	..
	Alberico di Barbiano															
"	Bartolomeo Colleoni	5,069	555 0	51 0	14 5	95,000	Castellamare	1931	1932	..	..	..	8 6-in., 6 3.9-in. A.A., 6 M., 1 catapult, 2 seaplanes	37	oil	..
	Giov. della Bande Nere															

cr.	Trieste	10,000	640	9	67	7	18½	150,000	Orlando, Leghorn, Trieste	1926	1929	2½	..	..	(8 8-in., 16 3.9-in. A.A., 12 smaller, 1 catapult, 3 seaplanes.	4	35	—	800
"	Trento	..	..	..	..	..	..	..	..	1927	..	—	..	..	..	(win a. w.	..	..	..
L. c.	Ancona. (ex German Grandenz)	3838	456	0	45	0	17	26,000	Kiel	1913	1915	4-2½	..	..	7 5.9-in., 3 3.9-in. A.A., 3 M., 120 mines	4	27.5	1279	364
"	Bari (ex-German Pillau)	3248	440	11	46	0	19	27,400	Danzig (Schichau). turb.	1914	1915	1½-¾	..	..	8 5.9-in., 3 3.9-in. A.A., 3 M., 120 mines	2	27.5	984	372
"†	Brindisi (ex-Austrian Helgoland)	2756	430	0	42	0	15	25,000	Fiume. Tur.	1912	1914	2½	..	..	9 3.9-in., 1 3.9-in. A.A., 3 M., 1 L., 170 mines	4	27.0	750	320
"	Libia	3700	367	0	47	6	16	12,500	Genoa (Ansaldo)	1912	1913	1½	..	..	8 4.7-in., 3 3.9-in. A.A., 3 M.	..	22.9	640	300
s.c.	Miraglia*	4881	397	0	49	3	17	12,000	Spezia	1923	1927	..	..	..	4 4-in. A.A., 1 M., 2 catapults, 16 planes	..	21.5	—	300
L. cr.†	Quarto	2903	431	9	42	2	13½	25,000	Venice	1911	1913	1½-¾	..	..	6 4.7-in., 6 3.9-in., 2 2-pr. A.A., 3 M., 126 mines	2	28	49	240
L. cr.	Taranto (ex-German Strasbourg)	3272	446	2	43	7	15½	26,000	Wilhelmshaven	1911	1912	4-2½	..	..	7 5.9-in., 2 3.9-in. A.A., 3 M., 120 mines	2	27	1200	373
L. cr.†	Venezia (ex-Austrian Salda)	2756	430	0	42	0	15	25,600	Monfalcone	1912	1914	2½	..	..	9 3.9-in., 1 3.9-in. A.A., 3 M.	4	27.0	750	320

\* Ex-merchant ship, taken over on the stocks.

† Classified as Scouts in Italian Lista.

Minelayers and minesweepers Fasana, Buccari, Durazzo, Pelagosa, completed 1926, 600 tons, 11 knots, 1 3-in. gun, 200 mines; Azio, Legnano, Lepanto, Dardanelli, Milazzo, Ostia, completed 1926, 700 tons, 15 knots, 200 mines. Marghera, Brondobio, 117 tons, 13 knots, 60 mines; Laurana, Rovigno, Albons, 130 tons, 11 knots. Minesweepers Ansonia, 470 tons, 11.3 knots; Cotrone, Viesti, 475 tons, 13.8 knots; 35 in No., 200 tons, 13 knots. Oil transports Marte, Dalmatia, Istria, Livenza, Urano, Prometeo, Cocito, Lete, Stige, Niobe, Cerere, Giove, Tarvisio, Quarnero. Oil transport with under-water protection, Brennero. Gunboats and river gunboats, Arimondi, Cirene, Gallipoli, (i. Lante, Augusta, Otranto, P. Corini, Rimini, S. Caloto, E. Carlotto. Escort gunboats, A. Badile, T. Farinati, E. Giovannini, C. del Greco, A. Vitturi, 230 tons, 23 knots. Surveying vessel, Ammiraglio Magnaghi, 1800 tons, 14 knots. 104 armed motor boats (M.A.S.) built and 6 under construction.

Training ships Cristoforo Colombo built at Castellammare di Stabia, completed 1928, displacement 3,000 tons, 10 knots. Amerigo Vespucci (Castellammare di Stabia, 1931), 3,543 tons, 1,600 H.P. (Diesel), 11 knots, 4 3-in. A.A.

Submarine Depot Ships Volta and Pacinotti, 2,362 tons, 19 knots, 1 4-in., 2 3-in. A.A., completed 1924. Old cruiser F. Ferruccio (1905), 6,299 tons.



## JAPAN.—Battleships.

Class.	NAME. DATE FOR SCRAPPING UNDER WASHINGTON TREATY.	Standard Displacement. tons.	Length (Extreme.) ft. ins.	Beam. ft. ins.	Draught. ft. ins.	Horse-Power.	Where Built.	Date of Launch. Completion.	Cost.	Armour.				Armament.			Fuel. Coal. Oil.	Complement.	
										Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Second- ary.	Guns.			Torpedo Tubes.
b.	Fuso 1887	29,330	673	0.94	0.28	6 40,000 Kure tur.	Kure	1914 1915	..	12 K.S.	8	8 K.S.	..	12 K.S.	6	12 14-in., 16 6-in., 4 3-in. A.A., 4 M., 4 L., 2 sea- planes	22.5 (sub.) 27-in.	4000 1300	1272
b.	Hyuga 1940	29,990	683	0.94	0.28	8 45,000 Nagasaki tur. (Mitsubishi)	Nagasaki	1917 1918	..	12 K.S.	8	8 K.S.	..	12 K.S.	6	12 14-in., 20 5.5-in., 4 3-in. A.A., 2 M. H.A., 2 sea- planes	23.0 (sub.) 27-in.	4500 1300	1900
b.	Haruna* 1935	29,330	704	0.95	0.27	6 64,000 Kobe M.Y.P.L. (Kawasaki)	Kobe	1913 1915	..	8-3 K.S.	2½	6	..	10 K.S.	6	8 14-in., 16 6-in., 4 3-in. A.A., 4 M., 4 L., 2 planes	26.0 (sub.) 27-in.	oil	1250
b.	Ise 1939	29,990	683	0.94	0.28	8 45,000 Kobe P. tur. (Kawasaki)	Kobe	1916 1917	..	12 K.S.	8	8 K.S.	..	12 K.S.	6	12 14-in., 20 5.5-in., 4 3-in. A.A., 2 M. H.A., 2 sea- planes	23.0 (sub.) 27-in.	4500 1300	1900
b.	Kirishima* 1936	29,330	704	0.92	0.27	0 64,000 Nagasaki M.Y.P.L. (Mitsubishi)	Nagasaki	1913 1915	..	8-3 K.S.	2½	6	..	10 K.S.	6	8 14-in., 16 6-in., 4 3-in. A.A., 4 M., 4 L.	26.0 (sub.) 27-in.	oil	1250
b.	Kongo* 1934	29,330	704	0.92	0.27	6 64,000 Barrow Y. P. L.	Barrow	1912 1913 2,500,000	..	8-3 K.S.	2½	6	..	10 K.S.	6	8 14-in., 16 6-in., 4 3-in. A.A., 4 M., 4 L., 2 planes	26 (sub.) 27-in.	oil	1909 (as flag- ship)
b.	Mutsu 1942	32,720	700	0.95	0.30	0 46,000 G	Yokosuka Kure	1920 1921 1919 1920	..	12 K.S.	3½	..	..	..	..	8 16-in., 20 5.5-in., 4 3-in. A.A., 1-3 sea-planes	23.0 (sub.) 27-in.	1600 3400 (as flag- ship)	1904 1967
b.	Nagato 1941																		
b.	Yamashiro 1933	29,330	673	0.94	0.28	6 40,000 Yokosuka tur.	Yokosuka	1915 1917	..	12 K.S.	8	8 K.S.	..	12 K.S.	6	12 14-in., 16 6-in., 4 3-in. A.A., 4 M., 4 L., 2 sea-planes	22.5 (sub.) 27-in.	4000 1300	1272

ARMoured CRUISERS now rated as (LIGHT-DEFENCE SHIPS (1st class), completed 1899-1901: Nishin, 7080 tons, 20 knots, 4 8-in., 14 6-in.; Kasuya, 7080 tons, 20 knots, 1 10-in., 2 8-in.; Yakumo, 9010 tons, 20 knots, 4 8-in., 12 6-in.; Adzuma, 8640 tons, 20 knots, 4 8-in., 12 6-in.; Idzumo and Iwate, 9180 tons, 16 knots, 4 8-in., 8 6-in.; Asama, 9240 tons, 21½ knots, 4 8-in., 8 6-in.; Tsubama (2nd class), 3120 tons, 20 knots, 6 6-in., 8 3-in., 1 3-in. A.A.

\* Modernised 1928-1931, including fitting of bulges and new foremast, and conversion to oil burning. Hiyci of this class has been converted to a training ship in accordance with London Naval Treaty.

# JAPAN.—Aircraft Carriers.

Class.	NAME.	Standard Displacement. tons.	Length. (Extreme.) ft.	Beam. ft.	Draft. ft.	Horse-Power. (G.)	Where Built.	Date of Launch.	Date of Completion.	Cost. £	Armour.		Armament. Guns.	Torpedo Tubes.	Speed. knots.	Fuel.		Complement.
											Side Deck.	Gun Position.				Coal.	Oil.	
A.C.	Akagi *	26,900	763 p.p.	92	22 2	131,200 (G.)	Kure	1925	1927	..	in.	in.	10 8-in., 12 4·7-in. A.A., 50 planes	..	28·5	2100 tons.	3000	..
A.C.	Hosho †	7470	510 p.p.	62	20½	30,000 (G.)	Tsurumi (Asano)	1921	1922	..	..	..	4 5·5-in., 2 3-in. A.A., 28 planes	..	25	—	2700	550
A.C.	Kaga †	26,900	715 p.p.	102	22 1	91,000	Kobe (Kawasaki)	1921	1928	..	..	..	10 8-in., 12 4·7-in. A.A., 60 aircraft	..	25	—	5300	..
A.C.	Notoro §	14,050	445 p.p.	58	26½	5,850 (H.)	Kawasaki	1920	1920	..	..	..	2 5·5-in., 2 3-in. A.A., 15 scaplanes	..	12	..	..	..
A.C.	Ryujo	7600	548	60 8	15	40,000	Yokohama	1931	1932	..	..	..	12 5·1-in., 24 aircraft	..	25	..	..	600

\* Designed as a battle cruiser.

† Fitted with gyro-stabiliser.

‡ Designed as a battleship.

§ Converted from an oiler.

## JAPAN.—Cruisers, &amp;c.

Class.	NAME.	Standard Displacement.	Length (Extreme).	Beam.	Draft.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Torpedo Tubes.	Speed.	Fuel.	Complement.
											Slide.	Deck.				
		tons.	ft. about	ft.	ft.				Bldg.	£	in.	in.		knots.	tons.	
cr.	No. 1 .	8,500	650	..	..	..	{ Kure Nagasaki	..	Bldg.	..	..	..	..	..	..	..
"	No. 2 .	..	..	..	..	..	{ Kure Nagasaki	..	..	..	..	..	..	..	..	..
"	Chokai .	10,000	630	62½	16½	100,000	{ Nagasaki Kobe	{ 1931 1930	1932	..	..	..	8	9½	oil	..
"	Maya .	..	p.p.	..	..	..	{ Kure Yokosuka	..	..	..	..	..	..	..	..	..
"	Atago .	10,000	630	62½	16½	100,000	{ Kure Yokosuka	1930	1932	..	..	..	8	9½	oil	..
"	Takao .	..	p.p.	..	..	..	{ Kure Yokosuka	..	..	..	..	..	..	..	..	..
"	Ashigara .	..	..	..	..	..	{ Kure Yokosuka	..	..	..	..	..	..	..	..	..
"	Haguro .	..	..	..	..	..	{ Kure Yokosuka	..	..	..	..	..	..	..	..	..
"	Myoko .	10,000	630	62½	17½	100,000	{ Kure Yokosuka	{ 1928 1929	{ 1929 1929	..	8	—	12	33	—	692
"	Nachi .	..	p.p.	..	..	..	{ Kure Yokosuka	{ 1927 1928	1928	..	..	..	21-in.	..	..	..
cr.	Kinugasa .	..	..	..	..	..	{ Kawasaki, Kobe Nagasaki	{ 1926 1926	1927	..	..	..	..	..	..	..
"	Aoba .	..	..	..	..	..	{ Kawasaki, Kobe Nagasaki	{ 1926 1926	1927	..	..	..	..	..	..	..
"	Furutaka .	7,100	595	51	15½	95,000	{ Kawasaki, Kobe Nagasaki	{ 1925 1925	1926	..	..	..	12	33	400	604
"	Kako .	..	..	..	..	..	{ Kawasaki, Kobe Nagasaki	{ 1925 1925	1926	..	..	..	21-in.	..	1,400	..
"	..	..	..	..	..	..	{ Kawasaki, Kobe Nagasaki	{ 1925 1925	1926	..	..	..	..	..	..	..
"	Hirado .	4,400	475	46½	16½	22,500	{ Kobe P. tur. Nagasaki	{ 1911 1911	1912	..	2½	..	3	26	900	410
"	Yahagi .	..	..	..	..	My.	{ Kobe P. tur. Nagasaki	{ 1911 1911	1912	..	..	..	18-in.	..	900	..
"	..	..	..	..	..	..	{ Kobe P. tur. Nagasaki	{ 1911 1911	1912	..	..	..	..	..	..	..
"	Abukuma .	..	..	..	..	..	{ Uraga Uraga	{ 1923 1923	1925	..	..	..	..	..	..	..
"	Isuzu .	..	..	..	..	..	{ Uraga Uraga	{ 1921 1921	1923	..	..	..	..	..	..	..
"	Nagara .	5,170	535	46½	15½	90,000	{ Sasebo Sasebo	{ 1922 1922	1923	..	2	..	8	33.0	300	450
"	Natori .	..	..	..	..	(t.)	{ Nagasaki (Mitsubishi)	{ 1922 1922	1922	..	..	..	21-in.	..	1,200	..

L. cr.	Yura .	5170	535	47½	15½	90,000	(G.)	Sasebo .	1922	1923	2	..	7 5.5-in. 2 3-in. A.A., 2 m., 1 Pom-pom A.A., 1 sea- plane, 1 catapult	8	33.0	300	450
"	Kinu .	5170	535	47½	15½	90,000	(G.)	Kawasaki	1922	1922	2	..	7 5.5-in. 2 3-in. A.A., 2 m., 1 Pom-pom A.A., 1 sea- plane, 1 catapult	8	33.0	300	450
"	Jintsu.	5195	535	46½	15½	90,000		Kawasaki	1923	1925	2	..	7 5.5-in. 2 3-in. A.A., 2 m., 1 sea-plane, 1 catapult	8	33.0	300	450
"	Naka .	5195	535	46½	15½	90,000		Yokohama	1925	1925	2	..	7 5.5-in. 2 3-in. A.A., 2 m., 1 sea-plane, 1 catapult	8	33.0	300	450
"	Sendai	5195	535	46½	15½	90,000		Nagasaki	1923	1924	2	..	7 5.5-in. 2 3-in. A.A., 2 m., 1 sea-plane, 1 catapult	8	33.0	300	450
"	Kiso .	5100	535	47½	15½	90,000	(G.)	Nagasaki	1920	1921	2	..	7 5.5-in. 2 3-in. A.A., 2 m., 1 sea-plane, 80 mines	8	33.0	300	439
"	Kitakami	5100	535	47½	15½	90,000	(G.)	Sasebo .	1920	1921	2	..	7 5.5-in. 2 3-in. A.A., 2 m., 1 sea-plane, 80 mines	8	33.0	300	439
"	Kuma	5100	535	47½	15½	90,000	(G.)	Sasebo .	1919	1920	2	..	7 5.5-in. 2 3-in. A.A., 2 m., 1 sea-plane, 80 mines	8	33.0	300	439
"	Oi .	5100	535	47½	15½	90,000	(G.)	Kobe .	1920	1921	2	..	7 5.5-in. 2 3-in. A.A., 2 m., 1 sea-plane, 80 mines	8	33.0	300	439
"	Tama	5100	535	47½	15½	90,000	(G.)	Nagasaki (Mitsubishi)	1920	1921	2	..	7 5.5-in. 2 3-in. A.A., 2 m., 1 sea-plane, 80 mines	8	33.0	300	439
"	Tatsuta	3230	468	40½	13	51,000	(G.)	Sasebo .	1918	1919	2	..	4 5.5-in. 1 3-in. A.A., 2 m., Fitted for minelaying.	6	31	900	332
"	Tenryu	3230	468	40½	13	51,000	(G.)	Yokosuka	1918	1919	2	..	4 5.5-in. 1 3-in. A.A., 2 m., Fitted for minelaying.	6	31	900	332
"	Yubari	2880	465	39½	11½	57,000		Sasebo .	1923	1923	2	..	6 5.5-in. 1 3-in. A.A., 2 m., 34 mines	4	33	850	328

Two cruisers, No. 3 and No. 4, of 8500 tons are projected.

MINELAYERS.—Katsuriki 1917, 1540 tons, 13 knots, 3 3-in., 150 mines; Itankushima (Uraga, 1929), 1970 tons, 16 knots, 3000 H.P. (Diesel), 3 5.5-in., 2 3-in. A.A.; Yagoyama (1932), 1135 tons, 4800 H.P., 20 knots, 2 4.7-in. A.A.; Tokiwa, 9240 tons, 21 knots, 2 8-in., 8 6-in., 3 3-in., and 17 smaller vessels. A minelayer of 5000 tons and 3 smaller are projected.

MINESWEEPERS.—Nos. 1, 2, 3 (1923), No. 4 (1925), and Nos. 5, 6 (1929), 615 tons, 20 knots, 2 4.7-in., 1 3-in. A.A. Nos. 7, 8 (1911), 1030 tons, 24 knots, 1 4.7-in., 4 3-in.; Nos. 9, 10 (1918), 770 tons, 24 knots, 2 4.7-in.; Nos. 13, 14 (Building), 490 tons, and Nos. 15-18 are projected.

GUNBOATS.—Sega (1912), 685 tons, 15 knots, 3 8-in.; Uji (1903), 540 tons, 13 knots, 4 3-in.; Ataka (1922), 725 tons, 16 knots, 2 4.7-in., 2 3-in. A.A.; Yodo, 1820 tons, 22 knots, 2 3-in.

RIVER GUNBOATS.—Futami (1930), Atami (1929), 170 tons, 16 knots, 1 3-in. gun Katata, Hira, Hodzu, Seta (1923), 305 tons, 16 knots, 2 3-in. A.A.; Toba (1911), 215 tons, 16 knots, 2 3-in.; Fushimi (1906), 160 tons, 14 knots, 2 6-pr.; Sumida (1906), 105 tons, 13 knots, 2 6-pr.; and Kotaka (1930), 50 tons, 15 knots, 5 m.g.

SUBMARINE DEPOT SHIPS.—Chogei (1924), Jingei (1923), 5160 tons; Komahashi (1914), 1230 tons; Karasaki (1896), 9750 tons.

ANTI-SUBMARINE SHIPS.—Shirataka (1929), 1824 tons, 16 knots speed, three 4.7-in. A.A. guns. Teubane and Kamone (1929), 450 tons, 19 knots, 1 3-in.

3 vessels of "Kuma" class to be retained for training purposes only, in accordance with London Naval Treaty.

## NETHERLANDS.

Class.	NAME.	Standard Displacement.	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.				Armament.		Speed.	Fuel.	Complement.
										Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Gun Position.			
cr.	Celebes	tons. 5250	ft. 22	ft. 22	70,000	..	..	Bldg.	£	in.	in.	in.	in.	in.	in.	knots. 32	tons. 32	..
a.g.b.	Brinio	540	172½	28	1200	Amsterdam	1912 1914 1912 1914 1913 1915	..	..	2	3	..	..	..	..	14	34	52
"	Friso	540	172½	28	1200	Amsterdam	1912 1914 1912 1914 1913 1915	..	..	2	3	..	..	..	..	14	34	52
"	Gruno	540	172½	28	1200	Amsterdam	1912 1914 1912 1914 1913 1915	..	..	2	3	..	..	..	..	14	34	52
c.d.s.	Hertog Hendrik	4371	317	50	6282	Amsterdam	1902 1903	1906 1908	347,500	6	2	..	..	10	3	16.5	710	347
"	Jacob van Heems-kerck †	4445	321½	50	6396	Amsterdam	1906 1908	1906 1908	347,500	6-4	2	..	..	10	6	16.5	520	351
cr.	Java *	6670	509½	52½	65,000	Flushing	1921 1925	..	..	3	..	1	..	4	..	30	1070	490
"	Sumatra *	6670	509½	52½	65,000	Amsterdam	1920 1926	..	..	3	..	1	..	4	..	30	1070	490
c.d.s.	Marten Tromp †	4562	330	50	6405	Amsterdam	1904 1906	1904 1906	347,500	6-4	2	..	..	10	3	16.7	710	349
"	De Zeven Provinciën †	5644	333	56	8516	Amsterdam	1909 1910	1909 1910	..	6-4	2	..	..	10	4	16.3	885	409

Ships marked \* above are in the East Indies Squadron. The new cruiser is for this squadron.

Light cruiser Gelderland (1900), 3966 tons, now used as gunnery training ship. Four old gunboats: Hefring, 265 tons, Bruga, Tyr and Freyr, 275 tons. Gunboats in the Indian Military Marine: Soemba, Flores (1926-7), and 1 Jolham Maurits van Nassau (building). 1676 tons, 15 knots, three 5.9 in., one 3-in. A.A., 2 m. Minelayers: Nautilus (1930), used for fishery protection, 955 tons, 14 knots, one 3-in., two 1-pr., 2 m.; Douve Ankes, Van Meerlant (1929), 749 tons, 13.5 knots, three 3-in. A.A., 2 m., 30 mines; Medusa and Hydra (1911), 670 tons, 11.5 knots, three 3-in., one 1-pr., 1 m., 65 mines; a new vessel authorised and eight old vessels. Minelayers attached to Indian Military Marine: Krakatau (1924), 1120 tons, 17 knots, two 3-in. A.A., 2 m., 150 mines; Pro Patria (1923), 605 tons, 11 knots, one 3-in. A.A., 2 m., 80 mines; Priesa Von Orange and Goudon Loeuw (1932), 1206 tons, 15 knots, two 3-in.; Regel (1931) and Hercules. Minewarppers: I.-IV., 270-295 tons; (for the Indian Military Marine): A, B, C, D (1930), 187 tons; and one 1600 tons building. Surveying vessels: Ellerts de Haan, Hydrograaf, and in the Indian Military Marine, Van Doorn, Van Gogh, Tydelem, and Willebrod Snellius. Submarine depot ships: Cornelius Drebbel, 787 tons, 6 knots; and (in Indian Military Marine) Pelikaan (1922), 2600 tons, 12 knots, four 2.75 in., 4 m. 4 C.M.B.'s.

† Of little fighting value.

# NORWAY.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)	Beam.	Draft.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.				Armament.		Speed.	Fuel.		Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Gun Position. Second-ary.		Guns.	Torpedo Tubes.	
c.d.s.	{ Eidsvold : } { Norge :	4166	310½	50½	16½	4500 Y.	Elswick	1900	1901	350,000	6 in. H.N.S.	2	..	..	6 in. H.N.S.	6	2 8·9-in., 8 3-in., 6 3-in., 6 3-pr.	2 16·5 (sub.) 18-in.	550 —	270
"	Harald Haarfagre.	3860	30½	48½	16½	4500	Elswick	1896	1898	300,000	7 in. H.S.	2	..	..	8 H.S.	8	2 8·9-in., 6 4·7-in., 6 3-in., 2 3-in. A.A., 6 M.	3 16·5 (sub.) 18-in. 2 18-in. (sub.) 18-in.	550 —	249
"	Tordenskjold*							1897	1899											

Fishery Protection vessels Fridtjof Nansen (1931), 1500 tons, 15 knots, 2000 H.P., and Heimdal (1892), 660 tons, 12 knots. Minelayers Frøya (1918), 760 tons, 22 knots, 4-4-in., 100 mines; Glommen and Laugen (1918), 335 tons, 9½ knots, 50 mines; seven old gunboats refitted as minelayers, 280-280 tons. One minelayer (and training ship) is building, 1600 tons, 20 knots, 6000 H.P., 4-4-7-in. and 1 3-in. A.A. guns, and 2 T.R.S. 280 mines. Submarine depot ship Surpen, 187 tons, 9 knots. Four sloops (1400 tons) and six minelayers, 500 tons, are projected, but no money has yet been voted.

\* Employed as training ship for Cadets.

# SOVIET UNION.—Battleships.

NAME.	Normal Displacement.	Beam.	Draft.	Horse-Power.	Where Built.	Makers of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.					Armament.		Speed.	Fuel. Coal. Oil.	Complement.	
										Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Gun Position. Second-ary.	Guns.				Torpedo Tubes.
b. Paris Commune (ex-Sevastopol)		ft.	ft.							in.	in.	in.	in.	in.			knots.	tons.		
b. October Revolution (ex-Gangut)																				
b. Marat (ex-Petro- parlovsk)	23,000	594	87	27½	42,000	Baltic Works	1911	1915	..	9-5	8	..	..	12-10	6	12 12-in., 16 4-7 in., 2 9-pr. A.A., 1 3-pr.	4 (sub.)	23	2000 1000	118
b. Krasni Lenin- grad (ex-Michael Frunze, ex-Pol- tava)																				
b. General Alexieff* (ex-Volya)	22,600	551½	89½	27	26,500	Nikolaev R.S.B. Co.	1914	1917	..	12-4	3-1½	9-8	..	12-8	5	12 12-in., 18 5-in., 4 3-5-in. A.A., 4 3-pr., 8 11-pr., 4 M. (sub.)	4 (sub.)	21	2300 720	125

\* Under French protection.

## SOVIET UNION.—Cruisers.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel.		Comments.
											Belt. Deck.	Gun Position.	Guns.	Torpedo Tubes.		Coal	Oil	
cr.	Admiral Istomin	7600	416	55	21	11,600	Petrograd	1900	Bldg. 1903	£	in.	in.	..	..	..	..	..	573
"	Admiral Kornilov	6730	416	55	21	11,600	Petrograd	1900	1903	..	..	..	14 6-in., 5 6-pr. A.A., 2 M.	..	20	964	..	573
L. cr.	Aurora (ex-S.S.R.)	6730	416	55	21	11,600	Petrograd	1900	1903	..	..	..	14 6-in., 5 6-pr. A.A., 2 M.	..	20	964	..	573
"	Almaz *	3300	363	43	17½	7,500	..	1903	1904	..	3	..	7 4½-in., 2 M.	..	19	650	..	300
"	Chevonaya-Ukrainia (ex-Ad. Nakhimov)	7600	507	50½	18½	50,000	Nikolaev	1915	1925	..	..	..	15 5½-in., 8 3-in. A.A., 4 M., 100 mines, 2 scaplanes	..	29½	540	600	600
"	Komintern (ex-Pamyat Merkuriya)	6675	440	54½	20½	19,500	Nikolaev	1903	1907	..	..	..	15 5½-in., 4 3-in., 4 6-pr.	2 (sub.)	23	1190	..	595
"	General Kornilov *	6675	439½	54½	20½	19,500	Sevastopol	1902	1905	..	..	..	16 6-in., 2 11-pr.	2 (sub.)	23	1100	..	595
"	Krasni Kavkaz (ex-Ad. Lazarev)	7600	507	50½	18½	50,000	Nikolaev	1916	1930	..	3	3	15 5½-in., 4 3-in. A.A., 4 4-in. A.A., 4 M., 100 mines	2 (sub.)	29½	540	600	650
"	Profintern (ex-Svietlana)	7600	507	50½	18½	50,000	Reval	1915	1925	..	3	3	15 5½-in., 4 4-in. A.A., 4 3-in., 4 M.	2 (a.w.)	29½	540	600	..
"	Voroshilov (ex-Ad. Grieg)	7600	507	50½	18½	50,000	..	..	1930	..	..	..	15 5½-in., 4 4-in. A.A., 4 3-in., 4 M.	2 (a.w.)	29½	540	600	..

\* Under French protection.

4 sloops, 2 gunboats, 6 river gunboats, 20 minesweepers, about 25 C.M.B.s, and miscellaneous other craft.



## SPAIN.

Class.	NAME.	Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel.	Complement.
		tons.	ft.	ft.	ft.					£	Side. Deck.	Gun Position.	Guns.	Torpedo Tubes.	knots.	Coal. Oil.	
<i>b.</i>	Jaime I. . . . .	14,224	459½	78½	25½	15,500 Y.	Ferrol .	1914	1922	..	ins. 8-6 K.S.	ins. 10 (heavy)	8 12-in., 20 4-in., 4 3-pr. A.A., 2 M.	—	20·2	1850	854
<i>l. cr.</i>	Canarias. . . . .	10,000	636	64	17-1	90,000 P. tur.	Ferrol .	{ 1931 } Bag. 1932 }	{ 1928 } 1930 1925 } 1928 1925 } 1927	..	{ 2-1 } 4 } 3 }	1	8 8-in., 6 4-7-in., 4 4-7-in. A.A., 8 2-pr. A.A., 2 seaplanes; 1 catapult.	{ 12 } 21-in. }	33·0	—	700
"	Baleares. . . . .																
"	Miguel de Cervantes .																
"	Almirante Cervera .																
"	Libertad <i>ex</i> -Principe Alfonso)	7475	579½	54	16½	80,000	Ferrol .	1925	1927	..	3	..	8 6-in., 4 4-in. A.A., 2 3-pr., 1 M.	12 21-in.	33·0	—	560
<i>g.b.</i>	Eduardo Dato . . . . .	1314 (nor- mal)	253½	33½	11½	1700	Ferrol .	{ 1923 } 1925 1922 } 1924 1922 } 1923	..	..	..	..	4 4-in., 2 3-pr., 2 M	—	15	324	131
"	Jose Canalejas . . . . .																
"	Antonio Canovas del Castillo)																
"	Lauria . . . . .	787 (nor- mal)	213½	30	9½	1100 Y	Cartagena	{ 1912 } 1912 1911 } 1911	..	..	..	..	4 3-in., 2 M.	—	14·0	148	121
"	Laya. . . . .																
<i>l. cr.</i>	Republica ( <i>ex</i> -Reina Vic- toria Eugenia)	4857	462	50	15½	25,500 P.T.	Ferrol .	1920	1922	..	3-1½	3	9 6-in., 4 3-pr. A.A., 1 3-in., 4 M., 1 L.	4 21-in.	25·5	1200	404
"	Mendez Nuñez . . . . .	4509	462	46	14½	45,000	Ferrol .	1922	1924	..	3	..	6 6-in., 4 3-pr. A.A., 4 M.	12 21-in.	29	800	320
<i>s.c.</i>	Dédalo . . . . .	11,385	418	55	23	3000	..	..	1922	..	..	..	2 4-1-in., 4 3-in., A.A., 25 seaplanes	—	13	—	—

Motor-launches, M 1, 2, 4, 5, 6; H 2, 3, 4, 40 tons. Training ships: Sebastian Elcano (1928), 3500 tons, 9·5 knots; Galatea (*ex*-Clarastella), 2500 tons, bought in Italy. Ten armed trawlers and several auxiliaries.  
 Submarine salvage vessel Kanguro (1917), 3000 tons, 10 knots, four 2-pr. 3rd class gunboat Macmahon, 1897 (114 tons). Surveying ship Giralda (2400 tons).  
 Three coastguard patrol vessels, 250 tons, authorized.

# SWEDEN.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.					Armament.		Speed.	Fuel	Complement.	
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position.	Guns.	Torpedo Tubes.				
<i>c.d.s.</i>	Aran .	3361	287	49½	16·7	7000 Y. t	Gothenburg	1901	1902	£ ..	in. 7	in. 1½	in. ..	in. 7½	in. 5	in. 5	2 8·3-in., 6 5·9-in., 10 6-pr., 1 1-pr.	2 sub. 18-in.	17·2	300	287
"	Drottning-Victoria	6899	396·7	61	21½	22,000 tur. Y.	Gothenburg	1917	1921	666,000	8-6 K.S.	1½	4 H.S.	..	8 K.S.	5 K.S.	4 11-in., 8 5·9-in., 6 3-in., 2 6-pr., 2 M.	—	23·0	690	450
<i>a.c.</i>	Fylgia .	4060	377·6	48·6	20·6	12,444 Y. t	Stockholm .	1905	1907	385,700	4 K.S.	2	..	..	5 K.S.	5 K.S.	8 6-in., 10 6-pr., 2 1-pr. .	2 sub. 18-in.	22·7	900	328
Hangar Cruiser	Gotland .	4527	442	50·6	14·7	33,000 tur. Y.	Gothenburg	1931	Bldg. 910,000 (estimated)	..	..	..	..	..	..	..	6 6-in., 4 3-in. A.A., 4 M., 100 mines, 8 aeroplanes, 1 cata-pult	6 sub. 21-in.	27·0	oil	453
<i>c.d.s.</i>	Gustav V. .	6889	396·7	61	21½	22,000 tur. Y.	Malmö .	1918	1921	666,000	8-6 K.S.	1½	4 H.S.	..	8 K.S.	5 K.S.	4 11-in., 8 5·9-in., 4 3-in., 2 6-pr., 2 M.	—	23·0	690	450
"	Manligheten	3361	287	49½	17·4	7400 Y.	Malmö .	1903	1904	..	7 K.S.	1½	..	..	7½ K.S.	5 K.S.	2 8·3-in., 6 5·9-in., 8 6-pr., 1 1-pr.	2 sub. 18-in.	17·0	300	287
"	Oscar II .	4085	313·6	50·5	18	9000 Y.	Gothenburg	1905	1907	..	6 K.S.	2	6 K.S.	6 K.S.	7½ K.S.	5 K.S.	2 8·2-in., 8 5·9-in., 8 6-pr., 1 1-pr.	2 sub. 18-in.	18·0	500	330
"	Sverige .	6889	392·7	61	21½	20,000 tur. Y.	Gothenburg	1915	1917	666,000	8-6 K.S.	1½	4 K.S.	..	8 K.S.	5 K.S.	4 11-in., 8 5·9-in., 6 3-in., 2 6-pr., 2 M.	—	22·5	690	450
"	Tapperheten	3361	287	49½	17·7	6000 Y.	Malmö .	1901	1903	..	7 K.S.	1½	..	..	7½ K.S.	5 K.S.	2 8·3-in., 6 5·9-in., 10 6-pr., 1 1-pr.	2 sub. 21-in.	16·5	300	287
"	Wasa .	3361	287	49½	17	6000 Y.	Stockholm .	1901	1902	..	7 K.S.	1½	..	..	7½ K.S.	5 K.S.	2 8·3-in., 6 5·9-in., 10 6-pr., 1 1-pr.	2 sub. 21-in.	16·5	300	287

Gustav V. and Sverige have been reconstructed and modernised. Drottning-Victoria is also to be reconstructed. Two older coast-defence ships, Oden, Thor (1897, 1899) (reconstructed 1915-16), 3297 tons, 16 knots, 5500 H.P. 2 10-in., 6 4·7-in., 8 6-pr. guns. Minclayer Clas Fleming, 1800 tons, 4 4·7-in., 20 knots, 100 mines; Vedette boats (employed as minesweepers). Söskaren, Sveparen, Sprängaren (1918), and 12 others. Torpedo gunboats, Jacob, Bagge, Örn, Psilander, 830 tons, 2 4·7-in., 1 torpedo tube, 20 knots. Building, 250 tons, 177 ft. long, 24 knots, 2 3-in. Torpedo gunboats, Jacob, Bagge, Örn, Psilander, 830 tons, 2 4·7-in., 1 torpedo tube, 20 knots. Gunboat Svensksund (1891), 354 tons. Depot ship for submarines, Svea, 3300 tons. Aircraft depot ship Dristigheten (1901), 3620 tons. Depot Ships:—Niord (1898), 3297 tons; Göta, 3350 tons. Sailing training ships: Af Chapman, Najaden, Jarramas and Falken.



## UNITED STATES.—Battleships.

Class.	NAME. DATE FOR SCRAPPING UNDER WASHINGTON TREATY.	Standard Displacement. tons.	Length. (Extreme). ft.	Beam. ft.	Draught. ft.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost. \$	Armour.					Armament.		Complement.		
											Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Gun Position. Second- ary.	Guns.	Torpedo Tubes.	Speed. knots.	Fuel. Coal. Oil.
b.	<b>Arizona</b> 1937	31,400 32,600	608	106½	27½	33,376 B. & W. P. tur. (G.)	New York (Navy Yard)	1915	1916	1,485,000	14-8 K.S.	3	..	..	18 K.S.	..	12 14-in. (45 cal.), 12 5-in., 8 5-in. A.A., 4 3-pr., 2 1-pr., 2 M., 2 L., 2 catapults, 3 aeroplanes	—	21.0	— 2322
b.	<b>Arkansas</b> * 1935	27,900 26,100	562	106	26	30,000 P. tur.	Camden, N.J. (N.Y.S.E. Co.)	1911	1912	964,000	11-5 K.S.	3	..	8-6 K.S.	11 K.S.	6½	12 12-in. (50 cal.), 16 5-in., 8 3-in. A.A., 4 3-pr., 2 1-pr., 2 M., 1 catapult, 2 aeroplanes	—	20.5	— 5100
b.	<b>California</b> 1941	32,300 32,600	624	97½	30½	28,500 Tur. (G.) electric drive	Mare Island (Navy Yard)	1919	1921	2,620,000	14-8 K.S.	3	..	..	18 K.S.	..	12 14-in. (50 cal.), 12 5-in., 8 5-in. 5-in. A.A., 4 6-pr., 2 M., 2 1-pr., 2 catapults, 3 aeroplanes	2 21-in. (sub.)	21	— 4656
b.	<b>Colorado.</b> 1942	32,600 32,500	624	97½	30½	27,300 B. & W. tur. electric drive	N.Y.S.B. Co.	1921	1923	1,383,000	13½-12 K.S.	..	..	..	18 K.S.	..	8 16-in. (45 cal.), 12 5-in., 8 5-in. A.A., 4 6-pr., 2 1-pr., 2 M., 2 catapults, 3 aeroplanes	2 21-in. (sub.)	21.0	— 4570

b. Idaho * 1939 (Particulars prior to modernisation)	† 32,000 624 30,800	97½	29	32,000 B. & W. P. tur. (G.)	Camden, N.J. (N. Y. S. B. Co.)	1917 1919 1,485,000	14 K.S.	3	..	18 K.S.	..	12 14-in. (50 cal.), 12 5-in., 8 3-in. A.A., 4 8-pr., 2 1-pr., 2 M., 2 L., 1 catapult, 3 aeroplanes	2 (sub.)	21	— 3271	1374
b. Maryland 1941	† 32,600 624 31,500	97½	30½	27,300 T.	Newport News	1920 1921 1,383,000	13½-12 K.S.	..	..	18 K.S.	..	8 16-in. (45 cal.), 12 5-in., 8 5-in. A.A., 4 6-pr., 2 1-pr., 2 M., 21-in., 2 catapults, 3 aeroplanes	2 (sub.)	21	— 4570	1407
b. Mississippi * 1938 (Particulars prior to modernisation)	† 32,000 624 30,100	97½	30	32,000 B. & W. Cur. t. (G.)	Newport News	917 1917 1,485,000	14 K.S.	3	..	18 K.S.	..	12 14-in. (50 cal.), 12 5-in., 8 3-in. A.A., 4 6-pr., 2 1-pr., 2 M., 1 catapults, 3 aeroplanes	2 (sub.)	21	— 3271	1374

\* Now being modernised. The particulars given above are prior to modernisation.

† Displacement accepted at Washington Conference.

‡ The sums given in this column are exclusive of the cost of armour and armament according to the system of making appropriations in the estimates.

## UNITED STATES.—Battleships—continued.

Class	NAME. DATE FOR SCRAPPING UNDER WASHINGTON TREATY.	Standard Displacement	Length (Extreme)	Beam	Draft	Horse Power.	Where Built.	Date of Completion.	Cost.	Armour.					Armament.		Speed.	Fuel.	Complement.
										Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position.	Guns.	Torpedo Tubes.			
b.	Nevada §. 1936	27,500 29,000	583 108	28½	25,000	Quincy, Mass. (Fore River)	1914	1916	1,211,342	13½-8 K.S.	1½-8 K.S.	..	18½ K.S.	18-16 K.S.	10 14-in. (45 cal.), 12 5-in., 8 5-in. A.A., 4 6-pr., 2 1-pr., 2 M., 2 L., 2 catapults, 3 aeroplanes	..	20.5	— 2000	1920
b.	New Mexico 1939 (Particulars prior to modernisation)	32,000 30,000	624 97½	30	27,500	New York (Navy Yard)	1917	1918	1,485,000	14 K.S.	3	..	..	18 K.S.	12 14-in. (50 cal.), 12 5-in., 8 5-in. A.A., 4 6-pr., 2 1-pr., 2 M., 2 catapult, 3 aeroplanes	2 21-in. (sub.)	21.0	— 3271	1414
b.	New York * 1935	28,700 27,000	573 106	28½	28,100	New York (Navy Yard)	1912	1914	1,315,114	12-4 K.S.	3	9 K.S.	10 K.S.	14-8 K.S.	10 14-in. (45 cal.), 16 5-in., 8 5-in. A.A., 4 8-pr., 2 1-pr., 2 M., 1 catapult, 3 aeroplanes	—	21.0	— 5200	1450
b.	Oklahoma § 1936	27,500 29,000	583 108	29½	25,300	New York (Navy Yard)	1914	1916	2,200,000	13½-8 K.S.	1½-8 K.S.	..	18½ K.S.	18-16 K.S.	10 14-in. (45 cal.), 12 5-in., 8 5-in. A.A., 4 8-pr., 2 1-pr., 2 M., 2 catapults, 3 aeroplanes	—	20.5	— 2000	1920
b.	Pennsylvania† 1937	31,400 32,100	608 106½	29½	33,376	Newport News	1915	1916	1,485,000	14 K.S.	3	..	..	18 K.S.	12 14-in. (45 cal.), 12 5-in., 8 5-in. A.A., 4 8-pr., 2 1-pr., 2 M., 2 catapults, 3 aeroplanes.	..	21.0	— 2300	1880
b.	Tennessee . 1940	32,300 32,800	624 97½	30½	26,800	New York Navy yard	1919	1920	2,630,000	14 K.S.	..	..	..	18 K.S.	12 14-in. (50 cal.), 12 5-in., 8 5-in. A.A., 4 6-pr., 2 1-pr., 2 M., 2 catapults, 3 aeroplanes	2 21-in. (sub.)	21.0	— 4666	1407

b.	Texas* 1935	28,700 27,000	573 106	28½ B. & W. recip.	Newport News	1912 1914 1,166,000	12-4 K.S.	3	9 K.S.	10 K.S.	14-8 K.S.	6 K.S.	10 14-in. (45 cal.), 16 5-in., 8 3-in. A.A., 4 3-pr., 2 1-pr., 2 M., 1 catapult, 3 aeroplanes	— 590	21-0	1450
b.	West Virginia 1942	32,600 31,800	624 97½	30½ 27,300 T. electric drive.	Newport News	1921 1923 1,383,000	13½-1 K.S.	..	..	..	18 K.S.	..	8 16-in. (45 cal.), 12 5-in., 8 5-in. A.A., 4 6-pr., 2 1-pr., 2 M., (emb.) 2 catapults, 3 aeroplanes	— 470	2 21-0 (emb.) 21-in.	1407

Battleship Utah was converted to a target ship in 1931 in accordance with the London Naval Treaty, and the battleship Wyoming was converted to a training ship in 1931 in accordance with London Naval Treaty.

\* Modernised in 1927. Modernisation included fitting of bulge protection, protection of decks against aerial attack, conversion to oil burning, installation of 3-in. A.A. battery, and addition of catapults. Cost about £600,000 each ship. Displacement increased about 3000 tons.

† Modernised in 1931. Modernisation included fitting bulges, reboiler, increasing elevation of turret guns, replacing present anti-aircraft batteries by 5-inch A.A. guns, new masts and new fire control.

‡ Taken in hand for modernisation 1931. To complete 1933-4. Modernisation to include fitting increased deck protection, increasing elevation of turret guns, installation of eight 5-in. A.A. guns, reboiler, fitting of new turbines (the electric drive in New Mexico being replaced by turbine machinery), alterations to masts and bridges, and fitting of bulges. The alterations will add about 3000 tons to the displacement.

§ Modernisation in 1929. Alterations include fitting of bulges, deck protection, tripod masts, increasing elevation of turret guns, fitting a new 5-in. anti-aircraft battery.

|| Displacement accepted at Washington Conference.

## UNITED STATES.—Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extrem.)	Beam.	Draft.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Fuel.		Complement.
											Deck.	Gun Position.	Guns.	Torpedo Tubes.	Speed.	Coal. Oil.	
A.C.	Ranger CV4	13,800	727 (on w.l.)	80	19	53,500	S. B. & D. D. Co.	..	Bldg.	£ ..	in.	in.	8 5-in. A.A., 75 aircraft	..	knots. 29½	..	1434
A.C.	Lexington	33,000	880	106	30	180,000 tur. electric	Quincy, Mass.	..	1927	9,000,000	..	..	8 8-in., 12 5-in. A.A. 4 6-pr. Stowage for 72 aircraft. Fitted with a catapult.	..	33½	Oil	..
A.C.	Saratoga	33,000	888	106	30	180,000 tur. electric	N. Y. Ship-building Co.	1925	1927	9,000,000	..	..	8 8-in., 12 5-in. A.A., 4 6-pr., stowage for 80 aircraft. Fitted with a catapult.	..	33½	..	..
A.C.	Langley..	11,500	542	65½	19	7200	Mare Island Navy Yard	1912	1922 as aircraft carrier	..	..	..	4 5-in., 30 aeroplanes, 2 catapults.	—	15	— 2000	410

For particulars of Aircraft Tenders and Repair Ships, see page 267.



## UNITED STATES.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Traught	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost. \$	Armour.	Armament.	Speed.	Fuel.	Complement.
		tons.	ft.	ft.	ft.					£	Deck.	Guns.	knots.	tons.	
L. c.	No. 37. Tuscaloosa.	10,000	573	61½	19½	107,000	(New York, S. B. Co. Mare Island Navy Yard N. Y. Navy Yard)	..	Bldg. est. 1934	2,090,000 estimated	in.	9 8-in., 8 5-in. A.A., and 10 smaller, 2 catapults, 4 aircraft	32½	..	602
"	No. 38. San Francisco.	10,000	573 (onw.L.)	61½	19½	107,000	(Puget Sound Navy Yard Philadelphia Navy Yard)	..	Bldg. est. 1933	2,460,000	..	9 8-in., 8 5-in. A.A., 2 catapults, 4 aircraft	32.5	..	602
"	No. 32. New Orleans.	10,000	573 (onw.L.)	61½	19½	107,000	(Bethlehem S. B. Co. New York N. Y. Ship-building Co., Camden)	1932	Bldg. est. 1933	2,460,000	*	9 8-in., 8 5-in. A.A., 2 catapults, 4 aircraft	32.5	..	602
"	No. 34. Astoria.	10,000	573 (onw.L.)	61½	19½	107,000	(Bethlehem S. B. Co. New York N. Y. Ship-building Co., Camden)	1932	Bldg. est. 1933	2,210,000	..	9 8-in., 8 5-in. A.A., 2 catapults, 4 aircraft	32.5	..	602
"	No. 36. Minneapolis.	10,000	573 (onw.L.)	61½	19½	107,000	(Bethlehem S. B. Co. New York N. Y. Ship-building Co., Camden)	1932	Bldg. est. 1933	2,210,000	..	9 8-in., 8 5-in. A.A., 2 catapults, 4 aircraft	32.5	..	602
"	No. 33. Portland.	10,000	573 (onw.L.)	61½	19½	107,000	(Bethlehem S. B. Co. New York N. Y. Ship-building Co., Camden)	1932	Bldg. est. 1933	2,210,000	..	9 8-in., 8 5-in. A.A., 2 catapults, 4 aircraft	32.5	..	602
"	No. 35. Indianapolis.	10,000	573 (onw.L.)	61½	19½	107,000	(Bethlehem S. B. Co. New York N. Y. Ship-building Co., Camden)	1932	Bldg. est. 1933	2,210,000	..	9 8-in., 8 5-in. A.A., 2 catapults, 4 aircraft	32.5	..	602
"	No. 26. Northampton.	9050	..	..	16.3	..	(Bethlehem S. B. Co. New York N. Y. Ship-building Co., Camden)	1929	Bldg. est. 1933	2,180,000	..	9 8-in., 8 5-in. A.A., 2 catapults, 4 aircraft	32.5	..	..
"	No. 27. Chester.	9200	..	..	16.5	..	(Bethlehem S. B. Co. New York N. Y. Ship-building Co., Camden)	1929	Bldg. est. 1933	2,230,000	..	9 8-in., 8 5-in. A.A., 2 catapults, 4 aircraft	32.5	..	..
"	No. 28. Louisville.	9050	690	63.1	16.3	P.T. (G.)	(Elec. Corp. Puget Sound Navy Yard)	1930	Bldg. est. 1933	2,290,000	..	9 8-in., 8 5-in. A.A., 2 catapults, 4 aircraft	32.5	..	..
"	No. 29. Chicago.	9300	..	..	16.7	..	(Mare Island Navy Yard)	1930	Bldg. est. 1933	2,280,000	..	9 8-in., 8 5-in. A.A., 2 catapults, 4 aircraft	32.5	..	..
"	No. 30. Houston.	9050	..	..	16.3	..	(Newport News S. B. & D. D. Co. Tacoma.)	1929	Bldg. est. 1933	2,170,000	..	9 8-in., 8 5-in. A.A., 2 catapults, 4 aircraft	32.5	..	..
"	No. 31. Augusta.	9050	..	..	16.4	..	(Bethlehem S. B. Co. New York N. Y. Ship-building Co., Camden)	1930	Bldg. est. 1933	2,170,000	..	9 8-in., 8 5-in. A.A., 2 catapults, 4 aircraft	32.5	..	..
"	Cincinnati.	7050	555½	55½	13½	90,000 (G.)	(Wash. Philadelpia (Cramp))	1921	Bldg. est. 1933	Cost and fee	2½ side	126-in. (Cincinnati 10 6-in.) 4 3-in. A.A., 2 3-pr., 2 catapults, 2 aeroplanes	33.7	1800	450
"	Concord.	7050	555½	55½	13½	90,000 (G.)	(Quincy Mass. (Bethlehem))	1922	Bldg. est. 1933	Cost and fee	2½ side	10 6-in., 4 3-in. A.A., 2 3-pr., 2 catapults, 2 aeroplanes	33.7	1800	450
"	Detroit.	7050	555½	55½	13½	90,000 (G.)	(Quincy Mass. (Bethlehem))	1922	Bldg. est. 1933	Cost and fee	2½ side	10 6-in., 4 3-in. A.A., 2 3-pr., 2 catapults, 2 aeroplanes	33.7	1800	450

L. C.	Marblehead	7050	555½	13½	90,000 (G.)	Philadelphia (Cramp)	1923 1924 1921	1924 1925	Cost and fee side	..	12 6-in. Marblehead, 11 6-in., 4 3-in. A.A.; 2 3-pr., 2 catapults, 2 aeroplanes.	6 21-in.	33.7	— 1800	450
"	Memphis		55½			Tacoma, Wash.	1920	1923							
"	Milwaukee					Tacoma, Wash.	1920	1923							
"	Omaha					Quincy, Mass.	1923	1924	Cost and fee side	..	10 6-in. (Omaha, 12 6-in.), 4 3-in. A.A.; 2 3-pr., 2 catapults, 2 aeroplanes	6 21-in.	33.7	— 1800	450
"	Raleigh	7050	555½	13½	90,000 (G.)	Philadelphia (Cramp)	1921	1923							
"	Richmond					American Brown Boveri Electric Corp.	1929	1929							
"	Salt Lake City				10,700 P.T. (G.)	New York Navy Yard, New York	1929	1930	3,400,000	..	10 8-in., 4 5-in. A.A., 2 3-pr., 2 catapults, 4 planes	6 21-in.	32½	— 3000	620
"	Pensacola	9100	585½	16		Philadelphia (Cramp)	1923	1924	Cost and fee side	..	12 6-in., 4 3-in. A.A., 2 3-pr., 2 catapults, 3 aeroplanes	6 21-in.	33.7	— 1800	450
"	Trenton	7050	555½	13½	90,000 P.T. (G.)										

\* Reported to be more heavily armoured than the previous 10,000-ton cruisers.

§ Prices exclusive of armament.

3 Cruisers authorised, CL 39-41; may be laid down in 1933, '34, and '35. 5 Cruisers are projected, CL 42 to CL 46, but no money has yet been voted. Old Cruiser.—Rochester (1893), 7350 tons, 4 8-in., 8 5-in. A.A. Listed for disposal.

GUNBOATS.—Tulsa (1923), and Asheville (1920), 1575 tons, 12 knots, 3 4-in., 2 3-pr., 3 1-pr.; Helena (1897), 1892 tons, 15½ knots, 8 4-in., 4 3-pr.; Sacramento (1914), 1425 tons, 12½ knots, 3 4-in., 2 3-pr., 2 1-pr.; Fulton (1914), 1160 tons, 12 knots, 2 3-in. A.A.; and 7 others, used for training purposes.

RIVER GUNBOATS.—Guam (1927), Tutuila (1928), 370 tons, 14 knots, 2 3-in., 8 m.; Palos, Monocacy (1914), 180 tons, 13½ knots, 2 3-in.; Pansy, Oahu, 450 tons, 15 knots, 2 3-in.; Luzon, Mindanao, 575 tons, 16 knots, 2 3-in.

MINELAYERS.—Yosemite ex-San Francisco (1890), 3700 tons, 19½ knots, 3 5-in., 2 6-pr., 2 3-in. A.A., 300 mines; Baltimore (1889), 3950 tons, 20 knots, 4 5-in., 4 6-pr., 2 3-in. A.A., 2 1-pr., 300 mines; Oglala (1918), 4200 tons, 20 knots, 1 5-in., 2 3-in. A.A., 350 mines; 12 light mine-layers, ex-T.B.D.'s. MINESWEEPERS.—37 in number, "Bird" class (1918, 1919), 840 tons, 1400 H.P., 14 knots, 2 3-in. A.A. 6 are equipped as submarine salvage vessels (Chewink, Falcon, Mallard, Ortolan, Pigeon and Widgdon).

AIRCRAFT TENDERS.—Patoka (1919), 16800 tons, 10.9 knots, 2 5-in.; Heron (minesweeper) (1918), 950 tons, 14 knots, 2 3-in. A.A.; Jason (1913), 19,250 tons, 14 3 knots, 4 4-in., 27 planes. ARROSTOCK (1918) (minelayer), 4950 tons, 20 knots, 1 5-in., 2 3-in.

AIRCRAFT REPAIR SHIP.—Wright, 9558 tons, 15 knots, 6000 H.P., 2 5-in., 2 3-in. A.A., 27 planes.

DESTROYER TENDERS.—Dobbin, 12,450 tons; Whitney, 12,450 tons; Altair, Denebola, Rigell, 7600 tons; Melville, 7150 tons; Black Hawk, 8900 tons; Bridgeport, 11,750 tons.

SUBMARINE TENDERS.—Holland (1926), 11,570 tons, 16 knots, 8 5-in., 4 3-in. A.A., 2 6-pr.; Bushnell, Canopus, Camden, Savannah, Beaver, and Argonne. REPAIR SHIPS.—Medusa (1924), 9960 tons, 16 knots, 4 5-in., 2 3-in. A.A., 2 6-pr.; Vestal, Prometheus (1909), 8100 tons, 16 knots, 4 5-in., 1 3-in. 27 submarine chasers mounting 1 3 in. gun.

MONITOR.—Cheyenne (1902), 2300 tons.

5 Store ships, 6 Cargo ships, 3 Transports, 2 Hospital ships, 25 Patrol vessels (Eagle class, 430 tons, 18 knots, 2 4-in., 1 3-in. A.A.), and other auxiliaries.



## SHIPS OF THE LESSER NAVIES.

**Austria.**—Patrol vessels: Neretva, Compo (1918), 130 tons, 16 knots; Fogas (1916), 62 tons, 16 knots, and Pozsony (1918), 130 tons, 16 knots. These vessels have been disarmed and are unserviceable.

**Bulgaria.**—Under the terms of the naval clauses of the Peace Treaty, Bulgarian warships of all classes, existing or under construction, were surrendered to the Allied and Associated Powers or broken up. All vessels are under the Ministry of Commerce for police and preventive duties; six torpedo boats, two minesweepers and six motor boats of little value.

**China.**—Cruisers: Ning Hai (Kobe) and Ping Hai (Shanghai) (building), 2400 tons, 24 knots, six 5·5-in. and three 8·1-in. guns, Chao Ho (Elswick, 1912, 2600 tons), Ying Jui (Barrow, 1912, 2750 tons, 20 knots)—two 6-in., four 4-in., two 3-in., six 3-pr., two 1-pr., two 18-in. torpedo tubes; Hai Yung, Hai Chou, and Hai Chen (Germany, 1897–1898, 2950 tons, 19½ knots)—three 5·9-in., eight 4-in. and smaller, one submerged torpedo tube; Hai Chi (Armstrong's, 1899, 4300 tons, 24 knots)—two 8-in., ten 4·7 in., twelve 3-pr., ten maxims, five torpedo tubes. Destroyers: Chien Kang, Hsiao An, and Yu Chang, of 390 tons, speed 30 knots, armament: two 3-in., four 3-pr., and two 18-in. r.t. Torpedo boats: Eight. Gunboats: Yat Sen, 1650 tons, 20 knots, one 6-in., four 8-in. and eleven others. Six building. River gunboats: Forty-two. Also several dispatch vessels and torpedo gunboats. There are, in addition, a few gunboats and miscellaneous vessels belonging to the water-police of the Kwang Tung Province. One seaplane carrier, Teuck Sheng, building.

**Colombia.**—Gunboats: Presidente Mosquera, 200 tons; Chercinto (1897), 640 tons; Cartagena, Santa Maria, Barranquilla (Yarrows, 1930), length 130 feet, speed 15½ knots, one 8-in. gun. River gunboats: General Nerino and Esperanza, 400 tons, 15 knots. Motor boats: Cauca, 50 tons, four Guardacostas (Yarrow), 20 tons, and three 150 tons. Six revenue cutters building at Thornycroft's.

**Cuba.**—Light cruiser, Cuba, 2055 tons, 6000 H.P. 18 knots two 4-in., four 6-pr., four 3-pr., four 1-pr., 2 m., and the training ship Patria, 1220 tons, 16 knots; also 10 gunboats, Habana, Pinar del Rio, Villas, Matanzas, 80 tons, 12 knots, one 1-pr.; 24 de Febrero, 10 de Octubre, 218 tons, 12 knots, three 3-pr.; Baire, 500 tons, 14 knots, four 3-in., two 3-pr., 1 m.; Yara, 450 tons, 12 knots; 20 de Mayo, 200 tons, 12 knots; Enrique Villuendas, 178 tons, 16 knots. One patrol boat building, 115 tons, 3 guns.

**Czecho-Slovakia.**—There are two river gunboats carrying two 3-in. guns for training purposes and four small minelayers.

**Ecuador.**—The torpedo cruiser *Libertador Bolivar* (1896), disarmed and of no fighting value, mine-laying patrol vessels *Tarqui* and *Eurique Valdez* (50 tons), and gunboat *Cotopaxi* (1884), 700 tons.

**Esthonia.**—Destroyers: *Vambola* (*ex*-Kapitan Kingsbergen) (1918), 1260 tons, 35 knots, four 4-in. guns, 2 M., one 2-pr., 9 T.T., 80 mines, and *Lennuk* (*ex*-Avtroil) (1917), 1400 tons, 35 knots, five 4-in. guns, 2 M., one 2-pr., 9 T.T., 80 mines. Two mine-layers, two minesweepers, two ice-breakers, and Peipus Lake gunboats *Ahti* and *Tartu*. Torpedo boat *Sulev* (*ex*-German A 32) (1917), 243 tons, 26 knots, two 3-in., 2 torpedo tubes; gunboat *Laene*, river gunboat *Mardus*.

**Finland.**—Patrol boats *Klas Horn* (*ex*-Posadnik), *Uusimaa*, *Hämeenmaa*, *Matti Kurki* (*ex*-Voevoda), *Karjala* (*ex*-Filin), and *Turunmaa* (*ex*-Orlan); six C.M.B.'s; 6 ice-breakers, and three mine-sweepers, and 26 motor launches. Two armoured gunboats (5-in. belt), *Väinämöinen* and *Ilmarinen*, 4000 tons, 4000 H.P. (Diesel), 15 knots, four 10-in. guns, eight 4·7-in guns, building at A/B Maskin and Brobygggnads, Abo. Submarines *Iku-Turso*, *Vetehinen* and *Vesihäisi* (Abo 1930), 450 tons, speed 15 knots surface, 9 knots submerged, one 3-in. gun. Submarine-minelayer *Saukko* (Helsingfors, 1930), 99 tons.

**Hayti.**—Special service vessels, *Nord Alexis*, 1230 tons, two 4·7-in.; *Veretieres*, 270 tons; 17 *Decembre*, 851 tons; *Pacifique*, 488 tons.

**Hungary.**—Patrol vessels: *Sopron*, *Debreczen*, 138 tons, two 3-in., 4 M.; *Kecskemet*, *Szeged* and *Gyov*, 131 tons, four 3-in., 4 M.; *Birago*, 59 tons, one 3-in., 2 M.; also 12 motor launches.

**Latvia.**—Gunboat *Virsaitis* (*ex*-German M68), 480 tons, two 3-in., two 6-pr., one 3-in. A.A., one torpedo tube; 1 ice-breaker, *Krisjanis Valdemars*; 2 submarines (1927), *Ronis* and *Spidola*,  $\frac{390}{514}$  tons

$\frac{\text{surface}}{\text{submerged}}$  displ.,  $\frac{14\frac{1}{2}}{9\frac{1}{4}}$  knots, one 3-in., 2 M., 6 torpedo tubes; 2 mine-sweepers, *Imanta*, *Viesturs*, 225 tons, 14 knots, one 3-in., 4 M., 30 mines, completed in 1926; Surveying vessel, *Hidrografs*.

**Mexico.**—Coast defence vessel *Anahuac*, 3162 tons, 15 knots, two 9 4-in., four 4·7-in., four 6-pr., 2 M., 2 L.; gun-vessels, *Tampico* and *Vera Cruz* (Elizabeth Port, New Jersey, 1903); displacement, 980 tons; armament, two 4-in. Q.F., four 6-pr.; 16 knots; fitted to serve as transports for 200 troops, *Bravo* 1200 tons; 2,600 I.H.P.; 17 knots (Leghorn, 1904), and *Agua Prieta*, 1200 tons; 1800 I.H.P.;

15 knots. Training ship *Zaragoza*, 1200 tons, 1300 H.P., 15 knots, five 4·7-in., and one 6-pr. Q.F. Two revenue cutters. Four patrol boats.

**Paraguay.**—Gunboats: *Humayta* and *Paraguay* (1931), 740 tons, 17 knots, four 4·7-inch, four 3-inch A.A. guns; two older, *Capitan Cabral* and *Tacuari*. Two despatch vessels and two vedettes.

**Persia.**—Gunboats: *Babr* and *Palang* (Italy, 1932), 935 tons, 205 feet long, 950 H.P., 15 knots, two 4-in. and two 3-in. A.A. guns. Four patrol boats building in Italy, *Semorg*, *Chahbaaz*, *Karkass* and *Sharock*, 330 tons, 15½ knots, two 3-in guns. Also several old small gunboats and motor dhows.

**Peru.**—*Almirante Grau* and *Coronel Bolognesi*, cruisers 3200 tons; (*Barrow*, 1906); two 6-in., eight 3-in., eight maxim; 2 submerged torpedo tubes; 24 knots; converted to oil-burning 1925; also *Lima* (1880, refitted 1920) (parent ship for submarines), 1790 tons. Gunboat *America*, 200 tons, 14 knots. Destroyer, *Rodriguez*, 500 tons, 28 knots. Submarines R1–4, built in U.S.A. (1926–9), and R5 and R6 authorised,  $\frac{576}{682}$  tons,  $\frac{14\frac{1}{2}}{10}$  knots, one 3-in., 4 torpedo tubes. Two destroyers are projected.

**Poland.**—Five *ex*-German torpedo boats for police purposes. Gunboats *Komendant Pilsudski* and *General Haller*, 350 tons, 14 knots, built in Finland (1920). Training ship *Iskra*. Monitors *Warszawa*, *Horodyszczere*, *Krakow*, *Wilno*, *Torun*, *Pinsk*. One minesweeper, 200 tons, and twenty motor boats. Two destroyers, *Burza*, *Wicher*, completed 1931–2 at *Chantiers Navals Français*, 1515 tons, 35,000 H.P., 33 knots, four 5·1-in., one 2·9-in. A.A., 6 torpedo tubes. Three submarine minelayers built in France, *Rys*, *Zbik*, and *Wilk*, completed 1931–2;  $\frac{964}{1230}$  tons,  $\frac{1800}{1200}$  H.P., 14 knots surface, 9 knots submerged; one 4-in., one 2-pr., 6 torpedo tubes, 40 mines. Six more are projected.

**Portugal.**—The cruiser *Adamastor*, 1760 tons, 18 knots (*Leghorn*, 1897, reconditioned 1925), two 4·7-in., four 4·1-in., 3 torpedo tubes (14-in.). The minelayer *Vulcano* (151 tons) (*Thornycroft*, 1909). Two sloops, about 1200 tons, sold out of the British Navy, *Carvalho Araujo* (*ex*-*Jonquil*) and *Republica* (*ex*-*Gladiolus*). Coast defence vessel *Vasco da Gama* (1876, reconstructed 1903), 3030 tons, 15·5 knots, two 8-in., one 6-in., one 4-in. Destroyers *Douro*, *Tamega*, *Guadiana* (1913–24), 700 tons, 11,000 H.P., 30 knots, one 4-in., two 3-in., two torpedo tubes. Submarines *Foca*, *Golfinho*, and *Hidra* (*Laurenti*); 260–389 tons, 13–8·5 knots, 2 T.T. Gunboats *Damao* and *Zaire* (1919), and *Diu* (building at Lisbon), 400 tons, 700 H.P., 13 knots, two 3-in., two 3-pr., and there are 11 older ones. *Lagos* and *Faro* fishery inspection vessels.

Four destroyers, Vouga, Lima, Douro, and Tejo (1400 tons, 26 knots, four 4·7-in. guns), are being built by Yarrow's; two sloops, Pedro Nunes and Gonzalo Velho (1174 tons, 16½ knots, three 4·7-in. guns), by Hawthorne Leslie, Newcastle; an aircraft carrier, Sacadina-Cabral (5100 tons, 22 knots, four 4·7-in. guns); two submarines, Delfin and Espadaite (770 tons); and two dispatch boats, Albuquerque and Bartolomeu-Diaz (2000 tons, 21 knots) are authorised.

**Rumania.**—*River Monitors.*—Bucovina (1916), 540 tons, 12 knots, two 4·7-in., two 3-pr., two 11-pr. A.A.; Ardeal (1905), 440 tons, 10 knots, two 4·7-in., one 3-pr., one 3·5-in. A.A.; Basarabia (1915), 530 tons, 12 knots, two 4·7-in., two 3-pr., two 11-pr. A.A.; Lascar Catargiu, Ioan Bratianu, Milhail Kogalniceanu, Alexandru Lahovary (1907–08), 670 tons, 13 knots, three 4·7-in., two 3-pr., one 3-in. A.A., 2 M.

*Flotilla Leaders.*—Regele Ferdinand and Regina Maria (Naples, 1930, Thornycroft's design), 1785 tons, 38 knots; length 334½ ft., five 4·7-in., three 2-pr. A.A.; two twin torpedo tubes. Marasti, Marasesti (*ex*-Italian Nibbio, Sparviero), 1917–18, 1460 tons, 35 knots, five 4·7-in., four 3-in. A.A., 2 M., 2 twin torpedo tubes, 50 mines.

Seven vedettes, 50 tons, 18 knots.

*Gunboats.*—Stihi, Lepri Remus, Dumitrescu, Ghiculescu, completed 1916–17, 350 tons, 15 knots, two 3·9-in., 2 M. These are *ex*-French vessels.

*Submarine.*—Delphin (Quarnaro, Fiume, 1932). Displacement, 640 tons surface, 817 tons submerged; speed 14 knots surface, 9·5 knots submerged, one 4·2-in. gun, 6 torpedo tubes.

There are also five armed motor boats, police craft (*ex*-Austrian T.B.D.'s), Naluca, Sborul, Zmeul, and about seven armed launches.

A submarine dépôt ship, Constanta, 2264 tons (Fiume 1930).

**Siam.**—The gunboats Ratnakosindr (1925), 920 tons, two 6-in., four 3-in. H.A., 12 knots; Bali and Sugrib (1900), 580 tons, 11·5 knots, one 4·7-in., five 6-pr., 2 M.; Sukhodaya (Vickers, 1930), 1030 tons, 13 knots, two 6-in., four 3-in. A.A. Two 380-ton, 27-knot destroyers, built at Kobe, Sua Gamron Sindhu and Sua Tayanchou. Phra Ruan (*ex*-British Radiant, 1917), 719 tons, 35 knots. Five coastal motor boats. Training ship Chao Phra (1919), 840 tons, 16 knots.

**Turkey.**—The old battleship Torghud Reis (*ex*-German Weissenburg, 1891), refitted 1927, 9900 tons, 17 knots, six 11-in., three 15-pr., two 2·5-in. A.A., 2 submerged torpedo tubes. The battle-cruiser Yavouz Sultan Selim (*ex*-Goeben), 24,000 tons, 25 knots. Armament: ten 11-in., ten 5·9-in., twelve 22-pr., 2 M., 1 L., 4 submerged torpedo tubes. Light cruisers: Hamidieh (Elswick,

1904), 3830 tons, speed 22 knots, armament: two 5·9-in., four 3-in., four 3-pr., 2 torpedo tubes; Medjidieh (Philadelphia, 1903), refitted 1927, 3300 tons, speed 22 knots, armament: four 5·1-in., four 3-in., 4 m. Destroyers: Adatepe, Kocatepe (Ansaldo, Italy, 1931), 1430 tons, 39 knots, four 4·7-in. guns, 6 tubes. Tinaztepe and Zafer (Cantiere Navale del Tirreno, Italy, 1932), 1450 tons, 38 knots, four 4·2-in. guns, 6 21-in. tubes. Submarines Ikindji-in-Uni and Birindjiin-Uni (Fijenoord, Rotterdam, 1928),  $\frac{433}{556}$  tons,  $\frac{13\frac{3}{4}}{9\frac{3}{4}}$  knots, one 3-in., 1 m., 6 torpedo tubes. Dumlupinar (minelayer), (Monfalcone, 1931), 950 tons, 15 knots surface, 1200 tons,  $9\frac{1}{2}$  knots submerged, one 4-in. A.A., 40 mines. Sakarya (Montfalcone, 1931), 740 tons, 15 knots surface, 925 tons, 9 knots submerged, one 4-in.

**Uruguay.**—Torpedo-gunboat (training ship) Uruguay (1910), 1400 tons; two 4·7-in., four 3-in.; two 18-in. torpedo tubes. Surveying ship Capitan Miranda. Gunboat Rio Branco.

**Venezuela.**—Old gunboats Mariscal Sucre (1125 tons). General Salom (750 tons). Miranda (200 tons). Armed tug José Felix Ribas.

**Yugoslavia.**—Submarines Hrabri and Nebojsca, completed at Armstrong's 1928, displacement 975 tons surface, 1164 tons submerged; speed 15 knots surface, 10 knots submerged; mount two 4-in., 6 torpedo tubes. Smeli and Osvetnik, completed at Nantes, 1929; displacement 620 tons surface, 797 tons submerged, speed 14·5 knots surface, 9·25 knots submerged, carry one 4-in., one 2-pr., and 6 torpedo tubes. Two coastal motor boats, 38 knots, built at Thornycroft's, completed in 1927. Old cruiser Dalmacija (*ex*-German Niobe), refitted 1926, 2600 tons, is used as a gunnery and general training ship. There are four *ex*-Austrian river monitors, Vardar, Drava, Sava, Morava, 430–600 tons, mounting two 4·7-in.; eight *ex*-Austrian T.B.'s, two patrol boats, six mine-layers, one mine-sweeper (*ex*-Austrian T.B.'s); one seaplane depôt ship, Zmaj, 1870 tons, one training ship, two submarine depôt ships, and auxiliary craft.

One flotilla leader, Dubrovnik, built at Yarrow's, Scotstoun, completed 1932, length 371 feet, displacement 2400 tons, 42,000 S.H.P., speed 37 knots, carries four 5·5-in., 2 twin 2-pr., 2 triple 21-in. torpedo tubes.

## BRITISH AND FOREIGN FLOTILLAS.

## Great Britain.

Name or Number.	Built by.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).	Fuel Capacity, Oil.
			Length (Extreme).	Beam.	Draught.								
FLOTILLA LEADERS.													
			ft. ins.	ft. ins.	ft. ins.		Tons.		Knots.				Tons.
Exmouth .. ..	Portsmouth Dockyard	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Duncan .. ..	Portsmouth Dockyard	Bldg.	317 9	33 0	8 8	..	1400	36,000	35½	{ 4 4·7-in. } 1 3-in. A.A.	8	..	470
Kempenfelt ..	J. S. White ..	1931	317 9	33 0	8 7	..	1390	36,000	35½				
Keith .. ..	J. S. White ..	1931	323 0	32 3	8 6	2	1400	34,000	35	{ 4 4·7 in., 2 2-prs. } 5 4·7-in., 2 2-prs.	2 Q.	..	380
Codrington ..	Swan Hunter ..	1930	343 0	33 9	10 0	2	1540	39,000	35				
Abdiel .. ..	Cammell Laird ..	1916	325	31 9	11 3	3	1310	36,000	34	{ 3 4-in., 1 2-pr., 1 M., 4 L. Mine-layer.	..	130	515
Shakespeare ..	Thornycroft ..	1917	329	31 11	12 4	2	1480	40,000	36	{ 5 4·7-in. 1 3-in. A.A. 2 2-pr. A.A. 1 M., 4 L. }	2 T.	182	500
Spenser .. ..	" ..	1917											
Wallace .. ..	" ..	1919											
Keppel .. ..	" ..	1925											
Broke, ex-Rooke ..	" ..	1925	332 6	31 9	12 3	2	1530	40,000	36·5	{ 5 4·7-in. 1 3-in. A.A. 2 2-pr. A.A. 1 M., 4 L. }	2 T.	182	500
Bruce .. ..	" ..	1918											
Douglas .. ..	" ..	1918											
Campbell .. ..	" ..	1918											
Mackay, ex-Claverhouse ..	Cammell Laird ..	1918	332 6	31 9	12 3	2	1530	40,000	36·5	{ 5 4·7-in. 1 3-in. A.A. 2 2-pr. A.A. 1 M., 4 L. }	2 T.	182	500
Malcolm .. ..	" ..	1919											
Montrose .. ..	" ..	1918											
Stuart .. ..	" ..	1918											

1 Flotilla leader (1932 programme) is authorised for commencement in 1933.

## DESTROYERS.

Name or Number.	Built by.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).	Fuel Capacity. Oil.
			Length. (Extreme.)	Beam.	Draught.								
Eclipse .. ..	Denny ..	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Echo .. ..	" ..												
Escapade .. ..	Scotts ..												
Escort .. ..	" ..												
Electra .. ..	Hawthorn Leslie	Bldg.	317½ (b.p.)	33	8½	..	1375	36,000	35½	4 4·7-in. 1 3-in. A.A.	..	..	470
Encounter ..	" ..												
Esk .. ..	Swan Hunter												
Express .. ..	" ..												
Defender .. ..	Vickers ..	Bldg.	317½ (b.p.)	33	8½	..	1375	36,000	35½	4 4·7-in. 1 3-in. A.A.	8	..	470
Diamond .. ..	" ..												
Daring .. ..	Thornycroft												
Decoy .. ..	" ..												
Dainty .. ..	Fairfield ..	1932	317½ (b.p.)	33	8½	..	1375	36,000	35½	4 4·7-in. 1 3-in. A.A.	..	..	470
Delight .. ..	" ..												
Diana .. ..	Palmers ..												
Duchess .. ..	" ..												
Crusader .. ..	Portsmouth Dockyard	1931	323	32½	8½	2	1360	34,000	35	4 4·7-in., 2 2-pr.	2 Q.	..	390
Comet .. ..	" ..												
Cygnets .. ..	Vickers-Armstrongs												
Crescent .. ..	" ..												
Basilisk .. ..	Brown ..	1930	323	32½	8½	2	1330	34,000	35	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 Q.	..	390
Beagle .. ..	" ..												
Blanche .. ..	Hawthorn, Leslie												
Boadicea .. ..	" ..												
Boreas .. ..	Palmers ..	1930	323	32½	8½	2	1330	34,000	35	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 Q.	..	390
Brazen .. ..	" ..												
Brilliant .. ..	Swan, Hunter												
Bulldog .. ..	" ..												
Acasta .. ..	Brown ..	1930	323	32½	8½	2	1330	34,000	35	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 Q.	..	390
Achates .. ..	" ..												
Acheron .. ..	Thornycroft												
Active .. ..	Hawthorn Leslie												
Antelope .. ..	Hawthorn Leslie	1930	323	32½	8½	2	1330	34,000	35	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 Q.	..	390
Anthony .. ..	Scotts ..												
Ardent .. ..	Scotts ..												
Arrow .. ..	Vickers Armstr.												
Amazon (T) ..	Thornycroft ..	1927	323	31½	9	2	1350	39,500	37	4 4·7-in., 2 2-pr. 1 M., 4 L.	2 T.	140	433
Ambuscade (Y)	Yarrow ..	1927	322	31	8½	2	1170	33,000	37				

Torpedo tubes : D. = double.  
T. = Thornycroft design.

T. = triple.

Q. = quadruple.

Y. = Yarrow design.



## Great Britain—continued

Name or Number.	Built by.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).	Fuel Capacity. Oil.
			Length (extreme).	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
<b>DESTROYERS—</b>													
<i>Admiralty "S" Class:</i>													
Sabre .. ..	Stephen .. ..	1918											
Shamrock .. ..	Doxford .. ..	1919											
Saladin .. ..	Stephen .. ..	1919											
Sardonyx .. ..	" .. ..	1919											
Scimitar .. ..	Brown .. ..	1918											
Seafire .. ..	" .. ..	1918											
Searcher .. ..	" .. ..	1918											
Seraph .. ..	" .. ..	1918											
Serapis .. ..	" .. ..	1919											
Serene .. ..	" .. ..	1919											
Sesame .. ..	" .. ..	1919											
Sirdar .. ..	Fairfield .. ..	1918											
Steadfast .. ..	Palmer .. ..	1919											
Spindrift .. ..	Fairfield .. ..	1919											
Turbulent .. ..	Haw. Leslie .. ..	1919	276	26½	10½	2	905	27,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D.	98	301
Tenedos .. ..	" .. ..	1919											
Thanet .. ..	" .. ..	1919											
Thracian .. ..	" .. ..	1922											
Stronghold .. ..	Scott .. ..	1919											
Sturdy .. ..	" .. ..	1919											
Sportive .. ..	Swan Hunter .. ..	1918											
Swallow .. ..	Scott .. ..	1918											
Trojan .. ..	J. S. White .. ..	1918											
Trusty .. ..	" .. ..	1919											
Senator .. ..	Denny .. ..	1918											
Scout .. ..	Brown .. ..	1918											
Scotsman .. ..	" .. ..	1918											
Shikari .. ..	(Doxford } (Chatham }	1924											
<i>Admiralty "V" Class:</i>													
Vansittart .. ..	Beardmore .. ..	1919											367
Venomous .. ..	Brown .. ..	1919											363
Verity .. ..	" .. ..	1919	312	29½	10½	2	1120	27,000	34				370
Volunteer .. ..	Denny .. ..	1919											363
Veteran .. ..	Brown .. ..	1919											367
Wanderer .. ..	Fairfield .. ..	1919											365
Witch (T.) .. ..	(Thornycroft } (Devonport }	1925	312	30½	10·9	2	1140	30,000	35	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 T.	130	374
Wishart (T) .. ..	Thornycroft .. ..	1920											370
Wren .. ..	Yarrow .. ..	1923											368
Whitshed .. ..	Swan Hunter .. ..	1919											365
Wild Swan .. ..	" .. ..	1919											365
Witherington .. ..	J. S. White .. ..	1919											365
Wivern .. ..	" .. ..	1919	312	29½	10½	2	1120	27,000	34				365
Wolverine .. ..	" .. ..	1920											365
Worcester .. ..	" .. ..	1922											365
Whitehall .. ..	(Swan Hunter } (Chatham }	1925											365
Walpole .. ..	Doxford .. ..	1918											
Whitley .. ..	" .. ..	1918											
Waterhen .. ..	Palmer .. ..	1918	312	29½	10½	2	1100	27,000	34				367
Wryneck .. ..	" .. ..	1918											
Windsor .. ..	Scott .. ..	1918											
Wrestler .. ..	Swan Hunter .. ..	1918											
Woolston (T) .. ..	Thornycroft .. ..	1918	312	30½	10½	2	1120	30,000	35	4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	120	374
Wolsey (T) .. ..	" .. ..	1918											374
Wessex .. ..	Haw. Leslie .. ..	1918											369
Winchester .. ..	J. S. White .. ..	1918	312	29½	10·7	2	1100	27,000	34				369
Wolfhound .. ..	Fairfield .. ..	1918											369

Y = Yarrow design.

T = Thornycroft design.

Great Britain—*continued.*

Name or Number.	Built by.	Completed.	Dimensions.			Number of Screws.	Standards Displacement.	Horse-Power.	Mean Speed on Trial or expected.	Armament.	Torpedo Tubes.	Complement (War).	Fuel Oil.
			Length. (Extreme)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
Admiralty "V" Class—contd.													
Westminster ..	Scott ..	1918	312	29½	10·7	2	1100	27,000	34	4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	120	367
Westcott ..	Denny ..	1918											
Wakeful ..	Brown ..	1917											
Walker ..	Denny ..	1918											
Walrus ..	Fairfield ..	1918											
Warwick ..	Haw. Leslie ..	1918											
Watchman ..	Brown ..	1918											
Whirlwind ..	Swan, Hunter ..	1918											
Winchelsea ..	J. S. White ..	1918											
Voyager ..	Stephen ..	1918											
Vanessa ..	Beardmore ..	1918											
Vanity ..	" ..	1918											
Vidette ..	Stephen ..	1918											
Vivien ..	Yarrow ..	1918											
Valentine ..	C. Laird ..	1917											
Valkyrie ..	Denny ..	1917											
Valorous ..	" ..	1917											
Vampire ..	J. S. White ..	1917											
Vimy (late Vancouver) ..	Beardmore ..	1918											
Vanoc ..	Brown ..	1917	312	29½	10½	2	1090	27,000	34	4 4-in., 1 2-pr., 1 M., 4 L. A. A., 1 M., 4 L.	1 T., 1 D. 3	120	369
Vanquisher ..	" ..	1917											
Vectis ..	J. S. White ..	1917											
Vega ..	Doxford ..	1917											
Velox ..	" ..	1918											
Vendetta ..	Fairfield ..	1917											
Venetia ..	" ..	1917											
Venturous ..	Denny ..	1917											
Verdun ..	Haw. Leslie ..	1917											
Versatile ..	" ..	1918											
Vesper ..	Stephen ..	1918											
Vimiera ..	Swan Hunter ..	1917											
Violent ..	" ..	1917											
Vivacious ..	Yarrow ..	1917											
Vortigern ..	J. S. White ..	1918											
Viceroy (T) ..	Thornycroft ..	1918											
Viscount (T) ..	" ..	1918											
Admiralty "R" Class;													
Tempest ..	Fairfield ..	1917	275½	26½	10½	2	900	27,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D. (Restless has 1 D.)	98	296½
Tetrarch ..	H. & Wolff ..	1917	275½	26½	10½	2							
Thisbe ..	Haw. Leslie ..	1917	275½	26½	10½	2							
Thruster ..	" ..	1917	275½	26½	10½	2							
Torrid ..	Swan Hunter ..	1917	275½	26½	10½	2							
Skate ..	Brown ..	1917	276	26½	10½	2	900	27,000	36				
Rowena ..	" ..	1916	275½	26½	10½								
Restless ..	" ..	1916	275½	26½	10½								
Salmon ..	H. & Wolff ..	1916	275½	26½	10½								
Yarrow "R" Class;													
Tyrant ..	Yarrow ..	1917	271½	25¾	9½	2	760	23,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D.		256

8 Destroyers, 1932 programme, are authorised for commencement in 1933.



## Great Britain—continued.

## SUBMARINES.

Name or Number.	Where Built.	Completed.	Dimensions.			No. of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement (War).	Fuel Capacity.
			Length. (Extreme)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Severn	Vickers-Armstrong	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Sealion	Cammell Laird		..	..	..	..	..	..	..	..	..	..	..
Shark ..	Chatham ..		..	..	..	..	..	..	..	..	..	..	..
Porpoise	Vickers-Armstrong		267	29'8	13'8	..	1500	..	..	1 4'7 in.	..	..	..
Starfish	Chatham ..	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Seahorse			187	24	10'5	..	640	..	..	..	..	..	..
Swordfish	Chatham ..		(b.p.)	..	..	..	..	..	..	1 3-in. gun	..	..	..
Sturgeon	Vickers-Armstrong		1932	325	28	14'3	1,805	..	..	1 4'7-in. gun	6	..	..
Thames	Chatham ..	1931	290	29'8	13'8	..	1,475	..	..	..	..	..	..
Rainbow	Vickers-Armstrong	1930	290	29'8	13'8	..	2,015	..	..	..	..	..	..
Regent	Chatham ..	1931	290	29'8	13'8	..	2,015	..	..	..	..	..	..
Regulus		1931	290	29'8	13'8	..	2,015	..	..	..	..	..	..
Rover ..		1931	290	29'8	13'8	..	2,015	..	..	..	..	..	..
Parthian		1931	290	29'8	13'8	..	2,015	..	..	..	..	..	..
Perseus	Vickers-Armstrong	1930	290	29'8	13'7	..	1,475	4,400	17½	1 4-in. (Perseus has 1 4'7 in.)	8	55	156
Proteus	Chatham ..	1931	290	29'8	13'7	..	2,040	1,320	9	..	..	..	..
Pandora	Cammell Laird	1931	290	29'8	13'7	..	2,040	1,320	9	..	..	..	..
Phoenix		1931	290	29'8	13'7	..	2,040	1,320	9	..	..	..	..
Odin ..	Chatham ..	1929	283½	29'8	14'3	..	1,475	4,400	17½	1 4-in.	8	53	174
Olympus	Beardmore ..	1930	283½	29'8	14'3	..	2,030	1,320	9	..	..	..	..
Orpheus	Beardmore ..	1930	283½	29'8	14'3	..	2,030	1,320	9	..	..	..	..
Osiris ..	Vickers ..	1929	283½	29'8	14'3	..	2,030	1,320	9	..	..	..	..
Oswald	Vickers ..	1929	283½	29'8	14'3	..	2,030	1,320	9	..	..	..	..
Otus ..	Vickers ..	1929	283½	29'8	14'3	..	2,030	1,320	9	..	..	..	..
Oberon	Chatham ..	1927	270	28	13'5	..	1,311	2,950	15	1 4-in.	8	52	200
Oxley*	Vickers ..	1927	275	27'7	13'3	..	1,805	1,350	9	..	..	..	..
Otway*		1927	275	27'7	13'3	..	1,350	3,000	15½	..	..	..	..
X1 ..	Chatham ..	1925	363½	29'8	15'7	..	1,835	1,359	9	1 4-in.	6	..	..
R4 ..	Chatham ..	1919	163	15'5	11'6	..	2,425	6,000	19½	4 5'2 in., 2 Lewis	6	100	450
L71 ..	Scott's	1920	163	15'5	11'6	..	385	240	9½	1 L.	6	23	23
L69 ..	Beardmore ..	1923	163	15'5	11'6	..	500	1,200	15	..	..	..	..
L56 ..	Fairfield ..	1919	235	23'5	13'2	..	845	2,400	17½	2 4-in., 1 Lewis	6	44	110
L54 ..	Denny ..	1924	235	23'5	13'2	..	1,150	1,600	10½	1 4-in., 1 Lewis	..	..	..
L53 ..	Armstrong ..	1925	235	23'5	13'2	..	1,150	1,600	10½	2 4-in., 1 Lewis	..	..	..
L52 ..	Armstrong ..	1921	238½	23½	11'7	..	760	2,400	17½	1 4-in., 1 Lewis (L25, L17, and L14 have 1 Lewis, mines)	4	41	76
L27 ..	Vickers ..	1926	238½	23½	11'7	..	1,080	1,600	10½	..	..	..	..
L26 ..	Vickers ..	1926	238½	23½	11'7	..	1,080	1,600	10½	..	..	..	..
L25 ..	Vickers ..	1920	238½	23½	11'7	..	1,080	1,600	10½	..	..	..	..
L23 ..	Vickers ..	1924	238½	23½	11'7	..	1,080	1,600	10½	..	..	..	..
L22 ..	Vickers ..	1921	238½	23½	11'7	..	1,080	1,600	10½	..	..	..	..
L21 ..	Vickers ..	1920	238½	23½	11'7	..	1,080	1,600	10½	..	..	..	..
L20 ..	Vickers ..	1919	238½	23½	11'7	..	1,080	1,600	10½	..	..	..	..
L19 ..	Vickers ..	1919	238½	23½	11'7	..	1,080	1,600	10½	..	..	..	..
L18 ..	Vickers ..	1919	238½	23½	11'7	..	1,080	1,600	10½	..	..	..	..
L17 ..	Vickers ..	1918	238½	23½	11'7	..	1,080	1,600	10½	..	..	..	..
L16 ..	Fairfield ..	1918	238½	23½	11'7	..	1,080	1,600	10½	..	..	..	..
L14 ..	Vickers ..	1918	238½	23½	11'7	..	1,080	1,600	10½	..	..	..	..
H50 ..	Beardmore ..	1920	171	15'75	13	..	410	480	13	1 Lewis	4	23	16
H49 ..	Beardmore ..	1919	171	15'75	13	..	500	320	10½	..	..	..	..
H48 ..	Beardmore ..	1919	171	15'75	13	..	500	320	10½	..	..	..	..
H44 ..	Armstrong ..	1920	171	15'75	13	..	500	320	10½	..	..	..	..
H43 ..	Armstrong ..	1920	171	15'75	13	..	500	320	10½	..	..	..	..
H34 ..	Cammell Laird	1919	171	15'75	13	..	500	320	10½	..	..	..	..
H33 ..	Cammell Laird	1919	171	15'75	13	..	500	320	10½	..	..	..	..
H32 ..	Vickers ..	1919	171	15'75	13	..	500	320	10½	..	..	..	..
H31 ..	Vickers ..	1919	171	15'75	13	..	500	320	10½	..	..	..	..
H30 ..	Vickers ..	1918	171	15'75	13	..	500	320	10½	..	..	..	..
H28 ..	Vickers ..	1918	171	15'75	13	..	500	320	10½	..	..	..	..
H27 ..	Vickers ..	1913	171	15'75	13	..	500	320	10½	..	..	..	..
H24 ..	Vickers ..	1918	171	15'75	13	..	500	320	10½	..	..	..	..
H23 ..	Vickers ..	1918	171	15'75	13	..	500	320	10½	..	..	..	..

3 submarines, 1932 programme, are authorised for commencement in 1933.

\* Transferred from the Royal Australian Navy in 1931.

Great Britain—*continued.*

Sloops.

NAME.	Displacement.	Length (extreme).	Beam (extreme).	Draught.	Horse-Power.	Where built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Coal. Oil.	Complement
SLOOPS.		ft. ins.	ft. ins.	ft. ins.									
Grimsby .	..	..	..	..	..	Devonport	J. S. White	..	..	..	..	..	..
Leith .	..	..	..	..	..	Devonport	J. S. White	..	..	..	..	..	..
Halycon .	..	..	..	..	..	J. Brown	J. Brown	..	..	..	..	..	..
Skipjack .	..	..	..	..	..	J. Brown	J. Brown	..	..	..	..	..	..
Falmouth .													
Milford .	1105	281 4	35 0	8 4	2,000	Devonport	Hawthorn Leslie Yarrow Yarrow	1932	1932	1 4-in., 1 4-in. A.A. 4 3-pr.	16½	— 290	..
Weston- super-Mare						Chatham	Hawthorn Leslie		Bldg.				
Dundee .						Devonport	J. S. White & Devonport	1931	1931				
Bideford .						Chatham	J. S. White & Chatham	1932	1932	1 4-in., 1 4-in. A.A. 4 3-pr.	16½	— 290	..
Rochester .	1105*	281 4	35 0	8 0	2,000	Devonport	J. S. White & Devonport	1930	1931	1 4-in., 1 4-in. A.A. 8 smaller	16½	— 290	..
Fowey .						Chatham	J. S. White & Chatham	1930	1931				
Shoreham .						Devonport	Devonport	1930	1930	1 4-in., 1 4-in. A.A. 2 3-pr.	16½	— 280	
Hastings .	1025					Swan,	Hawthorn, Leslie	1930	1930	1 4-in., 1 4-in. A.A. 2 3-pr.	16½	— 280	
Penzance .		266 4	34 1	9 1	2,000	Hunter	Hawthorn, Leslie	1930	1930	8 smaller			
Folkestone						Swan,	Hawthorn, Leslie	1930	1930				
Scar- borough	1045					Hunter	Hawthorn, Leslie	1930	1930				
Bridgewater		266 4	34 0	8 6	2,000	Hawthorn	Hawthorn Leslie	1928	1929	1 4-in., 1 4-in. A.A., 4 1. 2 3-pr., 2 L.	16½	— 275	95
Sandwich	1045					Swan,	Hawthorn, Leslie	1930	1930				
Harebell .	1345	274 9	35 0	12 0	2,500	Barclay Curle	Barclay Curle	1918	1918	2 4-in., 2 12-pr., 2 L.	16-5	— 320	115
Chrysanthemum	1345	276 0	35 0	13 3	2,500	Armstrong	Wallsend Slipway	1917	1918	2 3-pr.	16-5	— 260	100
Bryony .	1345	275 3	35 0	12 10	2,500	Armstrong	Wallsend Slipway	1917	1917	1 M., 8 L.	16-5	— 260	70
Cornflower						Barclay Curle	Barclay Curle	1916	1916	2 4-in., 4 3-pr. A.A., 2 M., 8 L.	16-5	— 255	100
Delphinium						Napier & Miller	Dunsmuir & Jackson	1915	1916	2 4-in., 4 3-pr. 1 2-pr., 2 M., 8 L.	16-5	— 255	118
Godetia .						C. Connell	Rowan	1916	1916	1 4-in., 1 12-pr. 2 L.	16-5	— 255	
Lupin .	1175	267 9	33 6	12 0	2,000	Simons	Simons	1916	1916	2 4-in., 4 3-pr., 1 2-pr., 8 L.	16-5	— 182	100
Rosemary						Richardson Duck	Blair	1915	1916	1 4-in., 2 2-pr. 2 M., 8 L.	16-5	— 260	
Snapdragon						Ropner	Blair						
Verbena .						Blyth Co.	Richardson's, Westgarth	1915	1916	2 4-in., 4 3-pr. 2 3-pr., 8 L.	16-5	— 255	100
Heliotrope	1163	262 6	33 0	12 3	1,800	Lobnitz	Lobnitz	1915	1915	4 3-pr. 1 4-in., 2 2-pr., 2 M., 8 L.	16-5	— 250	100
Daffodil .						Scott's	Scott's						
Laburnum						Connell	Rowan			2 4-in., 4 3-pr. 2 2-pr., 8 L.	16-5	— 250	100
Veronica .	1165	262 6	33 0	12 6	1,800	Dunlop Bremner	Dunlop Bremner	1915	1915				
Foxglove .													

4 sloops, 1932 programme, are authorised for commencement in 1933.

\* Estimated displacement.



Great Britain—*continued.*

TWIN-SCREW MINESWEEPERS, RIVER GUNBOATS.

NAME.	Displacement.	Length (extreme).	Beam (extreme).	Draught.	Horse-Power.	Where built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Coal. Oil.	Complement.
<b>TWIN-SCREW MINE- SWEEPERS.</b>													
Aberdare . . .						Ailsa	Ailsa	1918	1918				
Abingdon . . .						Ailsa	G. Clark	1918	1919				
Albury . . .						Ailsa	Ailsa	1919	1919				
Alresford . . .						Ailsa	W. H. Allen	1919	1919				
Bagshot . . .						Ardrossan Dry Dock Co.	W. H. Allen	1918	1919				
Derby . . .						Clyde S.B. Co.	Clyde S.B. Co.	1918	1918				
Dundalk . . .						Do.	Do.						
Dunoon . . .						Do.	Do.						
Fermoy . . .						Dundee S.B. Co.	Cooper & Greig	1919	1919				
Fareham . . .						Dunlop, Brenner	Dunlop, Brenner	1918	1918				
Forres . . .						Clyde S.B. Co	G. Clark	1918	1919				
Tiverton . . .						Simons	Simons	1918	1918				
Elgin . . .						Do.	Do.			1 1/2-in., 1 12- pr. A.A. (except Forres and Marazion, 1 6-pr.)			
Caterham . . .						Bow, McLachlan	Bow, McLachlan	1919	1919				
Carstairs . . .	710	231 0	28 7	9 0	2,200	McMillan	Do.				16	190	75
Sutton . . .						Murdock & Murray	Yarrow						
Saltash . . .						Do.	Do.	1918	1918				
Saltburn . . .						Do.	Do.						
Selkirk . . .						Do.	D. Rowan	1918	1919				
Ross . . .						Do.	Do.	1919	1919				
Widnes . . .						Napier & Miller	Rowan						
Harrow . . .						Eltringham	Wallsend Slipway	1918	1918				
Huntly . . .						Do.	Eltringham						
Marazion . . .						Fleming & Ferguson	Fleming & Ferguson	1919	1919				
Lydd . . .						Fairfield	Fairfield	1918	1919				
Stoke . . .						C. Rennold- son	Shields Eng. Co.	1918	1918				
Pangbourne . .						Lobnitz	Lobnitz	1917	1917	1 3-in. A.A.	14	140	35
Tedworth . . .	675	231 0	28 0	9 0	1,800	Simons	Simons						
<b>RIVER GUN- BOATS.</b>													
Sandpiper . . .	185	160 0	30 0	2 0	600	Thornycroft		1933	Bldg.	1 3/7-in., 1 6-pr.	11 1/2	—	
Falcon . . .	354	150 0	28 8	4 9	2,250	Yarrow	Yarrow	1931	1931	1 3/7-in., 2 6-pr.	15	84	
Gannet . . .	310	185 0	29 0	4 0	2,250	Yarrow	Yarrow	1927	1928		16	—	60
Peterel . . .								1927	1927	2 3-in. A.A., 8 L.	14	60	60
Seamew . . .	262	168 0	27 0	4 0	1,370	Do.	Do.	1928	1928			50	
Tern . . .								1927	1927			—	
Aphis . . .						Ailsa	Ailsa	1915	1915	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.		100	
Bee . . .						Do.	Do.	1915	1916	1 6-in., 1 3-in. A.A., 2 3-pr., 8 L.		35	
Cicala . . .						Barclay Curle	Barclay Curle	1915	1916	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.		55	
Cockchafer . .						Do.	Do.	1915	1916	2 6-in., 1 3-in. A.A., 8 L.		—	
Cricketer . . .						Do.	Do.	1915	1916	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.		—	
Gnat . . .	625	237 6	36 0	4 6	2,000	Lobnitz	Lobnitz	1915	1915		14	—	55
Ladybird . . .						Do.	Do.	1915	1916	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.		100	
Mantis . . .						Sunderland S.B. Co.	N.E. Marine	1915	1915	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.		35	
Moth . . .						Do.	Do.	1915	1916			—	
Scarab . . .						Wood, Skin- ner	Do.	1915	1915	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.		80	
Tarantula . . .						Do.	Do.	1915	1916			105	
Moorhen . . .	180	165 0	24 6	2 3	670	Yarrow	Yarrow	1901 1904	1901 1904	2 6-pr., 8 L.	13	35	34

A gunboat, 1932 programme, is authorised for commencement in 1933.

## Argentine Republic.

Name or Number.	Where Built.	Launched	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
FLOTILLA LEADERS—													
Cervantes (ex-Spanish Churruca)	Cartagena ..	1925	331½	31½	10½	2	1650	42,000	36	5 4·7 in., 1 3-in. A.A., 4 M.	2 triple	—	—
Juan de Garay (ex-Spanish Alcala Galiano)													540
Mendoza ..	J. S. White, Covos	1928								5 4·7 in.,			—
La Rioja ..		1929	335	31·8	9·2	2	1520	45,000	36·5	1 3-in. A.A., 2 2-pr., 4 M.	2 triple	—	700
Tucuman ..		1929									21-in.		
DESTROYERS—													
Catamarca* ..	Schichau ..	1911	238·7	27	8·6	2	950	18,000	32	3 4-in.	4	100	—
Jujuy † ..	Germania ..												
Cordoba * ..	Schichau ..	1910	295	29·5	7·8	..	950	20,000	34·7 t.	3 4-in.			
La Plata † ..	Germania ..	1911										100	—
SUBMARINES—													
Santa Fe ..	Tosi Taranto	1931	221½	21½	13	2	850	3,000	17·5	1 4-in.	8	—	—
Salta ..							1080		9		21-in.		
Santiago del Estero													

\* Converted to oil-burning, 1927, at Buenos Aires. † Being converted to oil-burning at Buenos Aires.  
3 flotilla leaders and 3 submarines are projected.

## Brazil.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
<b>DESTROYERS—</b>													
Para ..	Yarrow ..	1908	240 p.p.	23·6	7·5	2	560	7,014	27·25	2 4-in., 3 prs.	2	75	140
Plabuy ..		1908						6,563	27·21				
Matto Grosso ..		1908						7,403	27·16				
Paratyba ..		1909						6,700	27·29				
Rio Grande del Norte		1909						7,778	27·27				
Alagoas ..		1909						7,403	27·25				
Santa Catharina ..		1909						6,982	27·30				
Parana ..		1910						8,877	28·74				
Sergipe ..		1909						8,554	27·60				
Maranhao (ex-Porpoise) ..	Thornycroft..	1913	265·3	26·5	10	..	934	22,500	31	3 4-in., 1 2-pr.	2 dble.	..	250
<b>SUBMARINES—</b>													
Humayta ..	Spezia (Ansaldo Fiat)	1927	282	25·6	15·2	2	1370	4,800	18·5	14-in. A.A.; carries mines	6 21-in.	55	140
F 1 ..	Spezia (Fiat)						1850	800	10				
F 3 ..		1913	150	13·6	12	..	250	800	13·5		2	..	..
F 5 ..							370	500	8		21-in.		

\* In bad condition



## Chile.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
<b>DESTROYERS—</b>													
Serrano .. .. .	Thornycroft's	1928	300	29	9·3	2	1090	28,000	35	3 4·7-in., 1 3-in.	2 triple 21-in.	130	— 340
Orella .. .. .													
Riquelme .. .. .													
Hyatt .. .. .													
Videla .. .. .													
Aldea .. .. .	White .. ..	{ 1912 1913	320 p.p.	32·6	11·1	3	1850	30,000	31·7	6 4-in. 4 M.	4	190	427 80
Almirante Lynch.													
Almirante Condeil													
Almirante Riveros													
(ex-Faulknor) ..													
Almirante Uribe	White .. ..	1914	320 p.p.	32·6	11	3	{ 1700 to 1740 }	30,000	31 31·5	2 4·7-in., 2 4-in., or 2 2-pdr. A.A.	4	174	403 83
(ex-Broke) .. ..													
Almirante Williams													
(ex-Botha) .. ..													
<b>SUBMARINES—</b>													
Capitan Thompson ..	Vickers Arm- strong's	1929	275	27·5	14·8	..	1520 1990	..	15 9	1 4-in.	8 21-in.	..	..
Capitan Simpson ..		1929											
Capitan O'Brien ..		1928											
H 1 .. .. .	Fore River, U.S.A.	1915	150·3	15·75	12·3	..	355 470	480 640	13 11	..	4	22	— 17·5
H 2 .. .. .													
H 3 .. .. .													
H 4 .. .. .													
H 5 .. .. .													
H 6 .. .. .													

3 submarines are projected (no money voted).

## Denmark.

Name or Number.	Where built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.													
			Length (Extreme).	Beam.	Draught.								Coal Oil													
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.													
TORPEDO BOATS.																										
FIRST CLASS—																										
Glintin .. .. .	{ .. .. .	..	198	19·5	..	..	285	6,000	28	2 3-in.	..	..	..													
Hogen .. .. .			{ Royal Dockyard, Copenhagen }	1930	198·9	19·5	7·4	2	281	6,000	28	2 3-in.	8 17·7 in.	—												
Ornen .. .. .															1929											
Laxen .. .. .															1930											
Hvalen .. .. .															1919											
R4. Havkatten †	1919																									
R5. Sælen †	{ Royal Dockyard, Copenhagen }	1917	126·3	13·9	9	2	96	2,000	24·6 t.	2 6-pr. A.A.	2 (1 in R2-4)	22	15 —													
R3. Nordkaperen †														1918												
R2. Makrelen †														1918												
S6. Narhvalen *														1917												
S5. Havhesten *														1917												
S4. Sömhunden *	{ Royal Dockyard, Copenhagen }	1916	148·2	16·9	7·5	2	158	3,480	26·2 t.	1 3-in.	4 18"	30	28 —													
S3. Sölvöven *														1917												
S2. Stören *														1916												
S1. Springeren *														1913												
P1. Hvalrossen †														1913												
O3. Sölvöven ..	{ Burmeister, Copenhagen }	1911	181·7	18	9·7	2	222	5,000	27·5	2 3-in.	5 18"	33	80 —													
O2. Flyvefisken ..														1911												
O1. Sörridderen ..														1911												
N3. Spækhuggeren														{ Royal Dock- Copenhagen }	1911	184·8	19·1	7·1	2	247	5,000	27·5	2 3-in.	5 18"	34	80 —
N2. Vindhunden ..																										
N1. Tumleren ..																										
SUBMARINES—																										
Daphne. D1 ..	{ Royal Dockyard, Copenhagen }	1926	161	16	8·2	..	305 370	900 400	13·4 7	1 3-in. A.A.	6	18	— 16													
Dryaden. D2 ..																										
Flora. C3 ..	..	1919	155·7	14·4	3·8	..	301 369	900 640	14·5 10·5	1 6-pr.	5	17	— 13													
Bellona. C2 ..																										
Rota. C1 ..	..	..	133·3	12·3	8	..	181 231	450 340	13·5 9·8	1 6-pr.	3	12	— 9													
B12. Galathea ..	..	..																								
Neptun. B11 ..	..	..																								
Triton. B10 ..	..	1914																								
Ran. B9 ..	..	1915	133·3	12·3	8	..	181 231	450 340	13·5 9·8	1 6-pr.	3	12	— 9													
Aegir. B8 ..	..	1914																								

\* Used as minesweepers.

† Used as patrol vessels.

## France.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.	
			Length. (Extreme.)	Beam.	Draught.								Coal	Oil
FLOTILLA LEADERS—			Feet.	Feet.	Feet.		Tons.		Knots.				Tons	
Le Fantasque .. . . .	Lorient.. . .	Bldg.	426	36	..	..	2,480	74,000	36-37	{ 5 5 5-in., 1 3-in., 4 1-pr. A.A. }	9	..	..	
L'Audacieux .. . . .	Ch. de la Méditerranée	Bldg.	423	39	14	..	2,440	74,000	36-37	{ 5 5 5-in., 1 3-in., 4 1-pr. A.A. }	9	..	..	
Le Malin .. . . .	Ch. de France													
L'Indomptable .. . . .	Ch. de France													
Le Triomphant .. . . .	Ch. de France													
Le Terrible .. . . .	Ch. de France													
Yauquelin .. . . .	Ch. de France, Dvnikirk	1932												
Kersaint .. . . .	Ch. de la Loire, Nantes	1931												
Cassard .. . . .	Ch. de Bretagne, Nantes	1932												
Tartu .. . . .	Ch. de la Loire, Nantes	1931	423	38½	14·8	2	2,440	70,000	36	{ 5 5 5-in., 1 3-in., 4 1-pr. A.A. }	6	220	..	
Brézé .. . . .	Ch. de Penhoet, St. Nazaire	1931												
Le Chevalier-Paul .. . . .	Ch. de la Méditerranée, Havre	1932												
Aigle .. . . .	Ch. de France, Dunkirk													
Vantour .. . . .	Ch. de la Méditerranée, Havre													
Albatros .. . . .	Ch. de la Loire, St. Nazaire	1930	426	38	14·8	2	2,440	74,000	37	{ 5 5 5-in., 1 3-in., 4 1-pr. A.A. }	6	220	..	
Gerfaut .. . . .	Ch. de Bretagne, Nantes													
Milan .. . . .	Lorient .. . .	1930	426	38	..	2	2,440	..	37	{ 5 5 5-in., 1 3-in., 4 1-pr. A.A. }	7	..	..	
Epervier .. . . .	Ch. de Penhoet, St. Nazaire	1928												
Valmy .. . . .	Ch. de la Loire, St. Nazaire	1928	427	37½	15	2	2,436	70,000	{ 39·9 40·1 t 36 }	{ 5 5 5-in., 4 1-pr. A.A. }	6	216	—	650
Verdun .. . . .	Ch. de France, Dunkirk	1930												
Vauban .. . . .	Dunkirk .. . .	1929												
Lion .. . . .	Lorient .. . .	1928	427	37½	15	2	2,436	70,000	36	{ 5 5 5 in., 4 1·5 in. A.A. }	6	216	—	650
Bison .. . . .	Lorient .. . .	1928												
Guépard .. . . .	St. Nazaire .. . .	1924												
Chacal .. . . .	Lorient Dy. .. . .	1923												
Jaguar .. . . .	St. Nazaire .. . .	1924	416	36	14·8	2	2,126	50,000	35·5	{ 5 5 1-in., 2 3-in. A.A. }	6	206	—	530
Leopard .. . . .	" .. . .	1925												
Lynx .. . . .	Lorient Dy. .. . .	1924												
Panthère .. . . .	Nantes .. . .	1924												
Tigre .. . . .	Germany .. . .	1917	346·5	33·5	14·8	2	1,525	44,000	34	4 5·9-in., 2 1-pr.	2 dbi.	180	—	700
DESTROYERS—														
Forbin .. . . .	Ch. de Gravelle, Le Havre	1928												
Frondeur .. . . .	Ch. Navals Français, Caen	1929												
Fougueux .. . . .	Ch. de Bretagne, Nantes	1928												
Foudroyant .. . . .	Ch. de Dyle et Baccalon, Bordeaux	1929												
Basque .. . . .	Maritime .. . .	1929	351·7	32·2	10·2	..	1,378	35,000	34	{ 4 5 1-in., 2 1-pr. A.A. }	6	146	—	300
Bordelais .. . . .	Bordeaux .. . .	1928												
Boulonnais .. . . .	Caen .. . .	1927												
Brestois .. . . .	Nantes .. . .	1927												
L'Adroit .. . . .	Dunkirk .. . .	1927												
L'Alcyon .. . . .	Bordeaux .. . .													
Le Fortune .. . . .	Caen .. . .													
Le Mars .. . . .	Caen .. . .	1926												
La Palme .. . . .	Nantes .. . .													
La Railleruse .. . . .	Nantes .. . .													
Bourrasque .. . . .	Dunkerque .. . .	1925												
Cyclone .. . . .	Havre .. . .	1925												
Mistral .. . . .	Caen .. . .	1924												
Orage .. . . .	St. Nazaire .. . .	1924	346½	31·7	10·2	2	1,319	33,000	33	{ 4 5 1-in., 1 3-in. A.A. }	{ 6 2 1·7 in. }	140	—	350
Simoun .. . . .	Rouen .. . .	1924												
Sirocco .. . . .	Nantes .. . .	1925												
Tempête .. . . .	Bordeaux .. . .	1924												
Tramontane .. . . .	Harfleur .. . .	1924												
Trombe .. . . .	Bordeaux .. . .	1925												
Typhon .. . . .	Barcelona .. . .	1925												
Tornado .. . . .	Normand, &c. . . .	1912	250	25·4	10·0	3	{ 679 698 679 679 688 }	{ 14,500 16,000 15,000 15,000 16,000 }	31	{ 2 3·9-in., 4 9-prs. }	2 dbi.	84	—	140
*Com. Rivière .. . . .	Toulon, etc. . . .	1913	257·5	25·5	10·0	3			31					
*Dehorter .. . . .														
*Bisson .. . . .														
*Protet, *Comm. Lucas, *Mangini .. . . .														

\* Fitted as mine-sweeper.

A flotilla leader is authorised, 2,400 tons, 6 5·5-in. guns; a destroyer is authorised, about 1,600 tons, 4 5·1-in. guns.



## France—continued.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
DESTROYERS—Contd.													
Ens. Roux, M. P. Lestin	Rochefort ..	1915	271	27	10·5	2	787	18,000	30	{ 2 3·9-in., 1 3-in., 4 9 pr.	2	98	206
Ens. Gabolde .. ..	Havre .. ..	1921	271	26·9	10·0	2	802	22,000	33	{ 3 3·9-in., 1 3-in. A. A.	4		98
Rageot-de-la Zouch, ex-H. 146 .. ..	Germany ..	1917	266	27·4	10·0	2	787	23,800	33·3	{ 3 4-in., 1 1-pr. 4 M., 40 mines.	6	111	295
Delage, ex-H. 147 ..	Germany ..	1917	269	27·2	10·0	2	806	20,150	30·5	{ 3 4·1-in., 2 M., 24 mines	{ 6	113	295
Buino, ex-V. 30 ..	Germany ..	1915											295
Pierre Durand, ex-V. 70	Germany ..	1917	272·3	27·3	11·5	2	767	16,800	28	3 4·1-in., 4 M.	6	113	246
Deligny, ex-S. 139 ..	Germany ..	1915	277·5	25·7	11·0	2	748	18,000	30·5	{ 2 3·9-in., 6 smaller.	4	120	168
Chastang, ex-S. 133 ..	Germany ..	1917											168
Vesco, ex-S. 134 ..	Germany ..	1911	290·5	28·5	11·5	..	915	24,000	27	{ 4 3·9-in., 1 1 3-pr. A. A. }	4	102	236
Mazare, ex-S. 135 ..	Germany ..	1917	272	24	10·5	..	601	11,060	29	{ 1 4·7-in., 4 3-in.	2 dbl.	106	98 115
Mateiot Leblanc, ex- Dukla .. ..	Fiume ..	1916	277·5	25·7	11·0	2	748	18,000	30·5	{ 2 3·9-in., 6 smaller.	4	120	168
Téméraire, Intrépide, Opiniâtre, Aventurier	Nantes ..	1911	290·5	28·5	11·5	..	915	24,000	27	{ 4 3·9-in., 1 1 3-pr. A. A. }	4	102	236
Annamite, Algérien, Arabe, Bambara, Hova, Kabyle, Mar- cain, Sakalave, Séné- galais, Somali, Ton- kinois, Touareg ..	Japan ..	1917	272	24	10·5	..	601	11,060	29	{ 1 4·7-in., 4 3-in.	2 dbl.	106	98 115
Bouclier .. ..	..	1912	237	24·7	9	..	629	14,000	35	{ 2 3·9-in. 4 9- pr. 13-in. A. A.	4	..	..

Four 1st class torpedo boats (1905-7), 85 tons, 26 knots, 1 3-in. gun, 3 torpedo tubes.

<b>CRUISER SUBMARINES—</b>													
Surcouf .. ..	Cherbourg ..	1929	393·7	29·5	23	2	Surf. Sub. 4300	Surf. Sub. 7600	Surf. Sub. 11	2 8-in.	14	130	..
<b>SUBMARINES, 1st Cl.</b>													
Agosta .. ..	Cherbourg ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Beveziers .. ..	Cherbourg ..		..	..	..	..	1380	..	..	..	..	..	..
Ouessant .. ..	Brest .. ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Sidi-Ferruchi .. ..	Ch. de la		..	..	..	..	1380	..	..	..	..	..	..
Sjax .. ..	Loire .. ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Casablanca .. ..	Cherbourg		..	..	..	..	1380	..	..	..	..	..	..
Glorieux .. ..	Cherbourg	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Centaure .. ..	Brest .. ..		..	..	..	..	1380	..	..	..	..	..	..
Héros .. ..	Brest .. ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Conquerant .. ..	Loire .. ..		..	..	..	..	1380	..	..	..	..	..	..
Tonnant .. ..	la Seine	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Espoir .. ..	la Seine		..	..	..	..	1380	..	..	..	..	..	..
Persée .. ..	Ch. Navals	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Protée .. ..	Français, Caen		..	..	..	..	1380	..	..	..	..	..	..
Argo .. ..	Forge et Ch. de	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Pégase .. ..	la Méditer- ranée la Seyne		..	..	..	..	1380	..	..	..	..	..	..
Phénix .. ..	Ch. de la Loire, St. Nazaire	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Achille .. ..	Ch. Dubigeon, Nantes		..	..	..	..	1380	..	..	..	..	..	..
Ajax .. ..	Brest .. ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Achéron .. ..	Ch. de la Loire, St. Nazaire		..	..	..	..	1380	..	..	..	..	..	..
Argo .. ..	Ch. Dubigeon, Nantes	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Acteon .. ..	Brest .. ..		..	..	..	..	1380	..	..	..	..	..	..
Pascal .. ..	Lorient .. ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Pasteur .. ..	Caen .. ..		..	..	..	..	1380	..	..	..	..	..	..
Poncelet .. ..	Ch. de Penhoet, St. Nazaire	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Henri Poincaré ..	Ch. de la Medi- terranée, la		..	..	..	..	1380	..	..	..	..	..	..
Archimède .. ..	Seyne	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Fresnel .. ..	Ch. de la Medi- terranée, la		..	..	..	..	1380	..	..	..	..	..	..
Monge .. ..	Seyne	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
*Perle .. ..	Toulon .. ..		..	..	..	..	1380	..	..	..	..	..	..
*Diamant .. ..	Cherbourg ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
*Rubis .. ..	Cherbourg ..		..	..	..	..	1380	..	..	..	..	..	..
*Nautilus .. ..	Cherbourg ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
*Saphir .. ..	Cherbourg ..		..	..	..	..	1380	..	..	..	..	..	..
*Turquoise .. ..	Cherbourg ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Redoutable .. ..	Cherbourg ..		..	..	..	..	1380	..	..	..	..	..	..
Vengeur .. ..	Cherbourg ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Requin .. ..	Cherbourg ..		..	..	..	..	1380	..	..	..	..	..	..
Morse .. ..	Cherbourg ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Narval .. ..	Cherbourg ..		..	..	..	..	1380	..	..	..	..	..	..
Souffleur .. ..	Cherbourg ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Caiman .. ..	Cherbourg ..		..	..	..	..	1380	..	..	..	..	..	..
Dauphin .. ..	Cherbourg ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Espadon .. ..	Cherbourg ..		..	..	..	..	1380	..	..	..	..	..	..
Marsouin .. ..	Cherbourg ..	Bldg.	..	..	..	..	1380	..	..	..	..	..	..
Phoque .. ..	Cherbourg ..		..	..	..	..	1380	..	..	..	..	..	..

## France—continued.

Number and Name.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement Surf./Sub.	Horse-Power.	Speed. Surf./Sub.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal Oil
			Length (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons
<b>SUBMARINES—</b>													
Minerve .. .. .	Cherbourg ..												
Junou .. .. .	Contract ..	Bldg.					570						
Venou .. .. .													
Iris .. .. .													
Orphée .. .. .	Ch. Normand, Havre	1932											
Oréade .. .. .		1932											
Orion .. .. .		1931											
Ondine .. .. .	Ch. Normand, Worms	1931					570	1300	13.7	1 3-in., A.A.	8		
Psyche .. .. .							790	—	—				
Sybill .. .. .		1932											
Vestale .. .. .	Schneider												
Sultane .. .. .													
Amphitrite .. ..	Ch. de la Seine Maritime, Le Trait	1932											
Antiope .. .. .	Chantiers Normand, Havre	1932											
Atalante .. .. .	Schneider et Cie Chalons-sur-Saône	1930											
Amazon .. .. .	Ch. de la Seine Maritime, Le Trait	1932	216½	16.2	12.7	2	565 790	1300 —	13.7 9.2	1 3-in. A.A.	8		
Diane .. .. .	Chantiers Normand, Havre	1930											
Meduse .. .. .		1930											
Argonaute .. ..	Schneider et Cie Chalons-sur-Saône	1929											
Arethuse .. .. .		1929											
Ariane .. .. .	Havre .. ..	1925					576	1200-	14	1 3.9-in. A.A.	7	40	
Danae .. .. .		1927	216.5	16	12.8	2	766	1000	9				
Eurydice .. .. .		1927											
Circe .. .. .	Chalons ..	1925											
Calypso .. .. .		1926	204.5	17.5	12.8	2	552	1250-	14	1 3.9-in. A.A.	7	40	
Doris .. .. .		1927					765	1000	9				
Thetis .. .. .	St. Nazaire	1925											
Naïde .. .. .		1925											
Sirène .. .. .		1925											
Nymphe .. .. .	St. Nazaire	1926	210	17	12.8	2	548	1300-	14	1 3.9-in. A.A.	7	39	
Galatée .. .. .		1925					744	1000	9				
Amphitrite .. ..	Rochefort ..	1914						(1300-)	14	1 3-in.	8	30	13
Atalante .. .. .	Toulon	1913	177	17.7	10.9	2	384-597	(700-)	7.8				
†Néréide .. .. .	Cherbourg ..	1914	243	19.8	12.3	2	771-1070	(2900-)	14	1 3-in.	8	40	56
Bellone, Hermione, Gorgone	Rochefort ..	1914 & 1915	198.9	17.7	11.9	2	484-783	(1500-)	12	1 3-in.	8	40	14
†Gustave Zédé ..	Cherbourg ..	1913	243	19.7	12.3		771-1080	(1800-)	15.5	1 3-in.	8	40	14
†Daphne .. .. .	Cherbourg ..	1915	223	18.0	12.0	2	647-882	(800-)	10	1 3-in.	8	47	68
†Joessel, Fulton ..	Cherbourg ..	1917	243	20.0	13.4	2	858-1181	(1500-)	11	1 3-in.	10	43	58
†Laplace .. .. .	Rochefort ..	1917						(1500-)	11				
†Lagrange .. .. .	Toulon	1917	246	21.0	13.0	2	838-1307	(2900-)	16½	2 3-in.	8	47	118
†Romazzotti, Regnault	Toulon	1918						(1650-)	17				
Armide .. .. .	Schneider ..	1915	184.6	17.0	10	2	420-665	(2600-)	17.4	2 3-in.	8	47	90
O'Byrne, Henry Fournier,	Chalons ..	1919	172	15.6	9.6		315-502	(1640-)	11		6	29	27
†Dupuy de Lôme, Sané	Chalons ..	1916 & 1915	246	20.9	13.7		748-1270	(2200-)	17.4				
†Pierre Chailley ..	Havre .. ..	1922	229.7	24.7	13.0		798-1181	(1020-)	14	1 3-pr.	4	24	10
†Maurice Callot ..	Bordeaux ..	1921	247.8	22	11.8		843-1270	(460-)	8				
†Pierre Marrast (ex-U. 162)	"	1918	235	21	12.7	2	744-1030	(2400-)	18	2 3-in.	8	40	99
†Jean Koulier (ex-U. 166)	"	1918	235	21	12.7	2	744-1030	(1660-)	11	(1 3.9-in., 2 M. 40 mines)	4	43	54
†Halbronn (ex-U. 139)	"	1918	302.2	30	15.5	2	1841-2516	(1400-)	9	(1 3-in., 40 mines)	6	48	44
†Jean Autric (ex-U. 105)	"	1917	234.5	21	12.5		744-1038	(2900-)	16½				
†Leon Mignot (ex-U. 108)	"	1917	234.5	21	12.5		744-1038	(1640-)	10				
Jean Corré (ex-U.B. 155) .. .. .	"	1917	182.5	19	12		464-640	(2400-)	16	1 4-in., 1 M.	6	48	98
Carissan (ex-U.B. 99)	"	1918	182.5	19	12		464-640	(1200-)	8.5				
Trinité Schillemans (ex-U.B. 94) .. ..	"	1917	267.5	24	14		1041-1525	(3300-)	13.6	25.9-in.	6	80	443
†René Audry (ex-U. 119) ..	"	1917	267.5	24	14		1041-1525	(1780-)	7.7				
†Victor Réveille (ex-U. 79) ..	"	1916	193	19.5	16		681-877	(2400-)	14.5	1 5.9-in., 1 M. 42 mines	4	54	213
								(1200-)	7.2				
								(1300-)	10	1 4.1-in., 1 M. 36 mines	2	40	64
								(800)	8				

French submarines are divided into two classes. 1st class: All vessels of 850 tons and above in the surface condition, including the U minelayers. 2nd class: All smaller vessels.

\* Mine-laying submarines.



## Germany.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal Oil
DESTROYERS—													
Itlis .. .. .	Wilhelms- haven	1927	304	28½	8½	2	800	23,000	34	3 4·1-in.	6 19·7 in.	115	—
Wolf .. .. .		1927											300
Tiger .. .. .													
Luchs .. .. .													
Jaguar .. .. .													
Leopard .. .. .	Wilhelms- haven	1926	287½	27½	10	2	800	23,000	33	3 4·1-in.	6 19·7 in.	115	—
Seeadler .. .. .		1926											300
Greif .. .. .		1926											
Albatros .. .. .		1926											
Kondor .. .. .		1926											
Falke .. .. .	Germania Works, Kiel	1926	233	25	10	2	650	16,000	31	2 4·1-in., 7 m.	2 19·7 in.	90	140
Möwe .. .. .		1912											60
G. 11. .. .. .													
G. 10. .. .. .													
G. 8 .. .. .													
G. 7 .. .. .													
TORPEDO BOATS—													
*S. 23 .. .. .	Shichau Elbing Kiel	1913	234·6	24·6	10	2	630	15,700	32	2 4·1-in., 7 m.	2 19·7 in.	90	132
*T. 196 .. .. .		1911											55
*T. 190 .. .. .	Vulcan Works, Stettin	1910	243	26	10·5	2	787	18,000	32	2 4·1-in., 2 m.	2 19·7 in.	98	160
*T. 185 .. .. .													54
*T. 151, 153, 155-8 ..	..	1907-8	237	25½	10·1	2	664	10,900	30	2 3·9-in.	2 19·7 in.	97	— 172

Four destroyers are projected; construction to commence in 1934.

Five torpedo boats are projected, construction to commence in 1936.

## Greece.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal Oil
DESTROYERS—													
Hydra .. .. .	Odero, Genoa	1931	310	30·0	11·0	..	1308	30,000	40	{ 4 4·7 in., 4 2-pr. A.A. }	{ 2 triple 21-in.	70	80 —
Spetsai .. .. .													
Psara .. .. .													
Conduriotis .. .. .													
Thyella .. .. .	Yarrow ..	1906	220	20·6	9·0	2	305	6006	30	2 3-in.	{ 2 18-in.	70	80 —
Sphendoni .. .. .													
Niki .. .. .	{ Stettin (Vulcan) }	1906	220	20·6	9·0	2	275	6000	30	{ 2 3-in., 4 6-pr. }	{ 2 21-in.	70	80 —
Aspis .. .. .													
†Aetos, †Leon, ..	Birkenhead	1911	293	27·7	9·6	..	1013	19,750	32	{ 4 4-in., (Panther and Aetos, 40 mines) }	{ 6 21-in.	110	— 266
†Panther, †Ierax ..													
SUBMARINES—													
Katsonis .. .. .	Schneiders, Harfleur	1926	203½	17·7	12·3	..	Surf. Sub.	1300	Surf. Sub.	{ 1 4-in., 1 2-pr. A.A. }	{ 6 21-in.	30	..
Papanicolis .. .. .	Ch. de la Loire, Nantes						567 760	1000	14 9·5				
Nereus .. .. .	Ch. de la Loire, Nantes	1927	226½	18½	12·6	2	689 945	1460 1200	14 9·5	{ 1 4-in., 1 2-pr. A.A. }	{ 8 21-in.	45	..
Proteus .. .. .		1927											
Triton .. .. .		1928											
Glaukos .. .. .	Ch. de France, Caen	1928											

Four 142-ton torpedo-boats built by the Vulcan Co. at Stettin: Arethusa, Doris, Aigli, Alkyonis, 25 knots.

The surrendered Austrian torpedo-boats: Pergamos, Kios, Proussa, Kyzikos and Kydonia, 237 tons, have been added to the Greek Navy for police duties.

Two coastal motorboats are building at Ernesto Breda, Venice, 35 tons displacement.

Four destroyers are projected.

† Reconstructed by Messrs. J. S. White & Co., Cowes, 1924-25.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
<b>* FLOTILLA LEADERS—</b>													
U. Vivaldi .. ..	Genoa	1929											
A. Usodimare ..	(Odero)	1929											
L. Tarigo .. ..	Genoa	1928											
L. Malocello ..	(Ansaldo)	1929											
L. Pancaldo ..	Riva Trigoso	1929											
A. Da Noli .. ..	(Cant. Navali)	1929											
E. Pessagno .. ..	Ancona	1929											
N. Da Recco .. ..	(Cant. Navali)	1929											
N. Zeno .. ..		1928											
G. Da Verazzano ..	Fiume	1928											
A. Cadamosto ..		1929											
A. Pigafetta .. ..		1929											
Leone .. ..		1923											
Pantera .. ..	Ansaldo	1924	359.3	34.3	11.5	..	1525	42,000	34	8 4.7-in. twins, 2 3-in. A.A., 60 mines.	4 18-in.	210	— 350
Tigere .. ..		1924	p.p.							4 4.7-in. 3-in. A.A., 50 mines	2 18-in.	140	— 260
Aquila .. ..	Pattison	1916	310	31	10.8	..	1407	39,800	36.5	4 4.7-in., 2 3-in. A.A., 50 mines	2 18-in.	140	— 260
Falco .. ..	Pattison	1916	310	31	10.8	..	1285	39,800	36.5	4 4.7-in., 2 3-in. A.A., 50 mines	2 18-in.	140	— 260
Premuda .. ..		1918	347.8	34	14.2	..	1525	48,000	36	4 5.9-in., 2 2-pr. A.A., 8 4-in., 4	2 dbl. 19.7-in.	..	— 720
Angusto Riboty ..	Ansaldo	1915	331.3	32.2	9.8	2	1382	35,000	35	2-pr. A.A., 100 mines.	2 18-in.	150	— 344
Carlo Mirabello ..		1914	p.p.										
<b>DESTROYERS—</b>													
Two in number (1932 programme)		Bldg.	..	..	..	..	625	..	..	..	..	..	..
Maestrale .. ..	Fiume												
Grecale .. ..	Ancona												
Libeccio .. ..	Ancona												
Scirocco .. ..	Genoa												
Dardo .. ..	(Odero, Sestri)	1930											
Strale .. ..	Pozente												
Freccia .. ..	(Cant. Navale di Tirreno, Sestri Levante)	1931 1932	311	30	11	..	1206	44,000	38	4 4.7-in. 4 M.	6 21-in.	..	..
Saetta .. ..	Cantieri												
Folgore .. ..	Partenopei,												
Lampo .. ..	Naples	1931	309	30.5	11	..	1220	44,000	38	4 4.7 in. 4 M.	6	..	..
Baleno .. ..	Quarnero Yard,												
Fulmine .. ..	Fiume												
Borea .. ..		1927											
Zeffiro .. ..	Ansaldo,	1927											
Espiro .. ..	Genoa	1927	307½	30	11	2	1073	35,000	36	4 4.7-in., 32-pr. A.A., 3 M., 52 mines	6 21-in.	140	— 340
Ostro .. ..		1928											
Aquilone .. ..	(Odero,	1927											
Turbine .. ..	Genoa	1927	311½	30	10.6	2	1092	35,000	36	4 4.7-in., 32-pr. A.A., 3 M., 52 mines	6 21-in.	140	— 340
Nembo .. ..	Genoa	1927											
Euro .. ..	Docks Co.	1927											
N. Sauro .. ..	(Odero	1926											
C. Battisti .. ..	Qvanaro,	1926	295½	30.2	10.5	..	1058	32,000	35	4 4.7-in., 32-pr. A.A., 3 M., 52 mines	6 21-in.	140	— 340
F. Nullo .. ..		1925											
D. Manin .. ..	Fiume	1925											
Francesco Crispi ..		1925											
Giovanni Nicotera ..	Naples	1926	278.6	28.2	10	2	935	28,000	35	22-pr. A.A., 2 M., 40 mines	2 dbl. 2 1-in.	106	— 200
Bettino Ricasoli ..	(Pattison)	1926											
Quintino Sella ..		1925											
Alessandro Poerio ..	Genoa												
Giulio Pepe .. ..	(Ansaldo)	1914	279	26.3	9.3	2	844	20,000	32	5 4-in., 2 2-pr. A.A., 5 4-in., 22-pr. A.A., 1 M., 10 mines	2 dbl.	100	— 260
† Impavido .. ..		1913											
† Indomito .. ..	Naples	1912	239½	24.0	8.4	2	540	13,500	30	5 4-in., 22-pr. A.A., 1 M., 10 mines	4	71	— 110
† Insidioso .. ..	(Pattison)	1913											
† Irriquieto .. ..		1913											
† Ardente .. ..	Orlando (Leghorn)	1912	239½	24.0	8.4	2	560	13,800	30	5 4-in., 22-pr. A.A. 10 mines	2	71	— 110
† Giuseppe Sirtori ..		1916											
† Vincenzo Orsini ..		1917	237½	24	9.0	2	670	15,000	32	6 4-in., 4 2-pr. A.A., 2 M.	4	100	— 150
† Francesco Stocco ..		1916											
† Giovanni Acerbi ..		1916											
† E. Cosenz .. ..		1916											
† Giacomo Medici ..	Genoa	1918											
† G. La Farina .. ..	(Odero)	1917											
† Nicola Fabrizi ..		1918											
† Angelo Bassini ..		1917	237½	24	9.0	2	635	15,500	31-34	4 4-in., 2 3-in., 2 M. Carries 10 mines.	4	100	— 150
† Giacinto Carini ..		1917											
† G. La Masa .. ..		1917											
† Fratelli Carli ..		1917											
† Antonio Mosto ..	Naples												
† Rosolino Pilo ..	(Pattison)												
† Giuseppe Abba ..		1914	236	24	8.8	2	615	13,500	30	5 4-in., 4 2-pr. A.A., 2 M.	4	71	— 150
† Ippolito Nievo ..	Genoa (Odero)												
Cesare Rossari ..													
ex-German B97 ..	Hamburg	1915	321½	30.6	9.5	2	744	40,000	34	3 4.7-in., 23-in. A.A., 24 mines	4	..	— 526

\* Designated scouts in Italian official list.

† Designated torpedo boats in Italian official list.



Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Standard Displacement	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—contd.													
*Simone Schiaffino ..	{ Genoa (Odero) }	1914	236	24	8·8	2	615	13,500	30	{ 5 4-in., 4 2-pr. A.A. 2 M.	4	71	— 150
*Giuseppe Dezza ..		1914											
*Giuseppe Missori ..		1915											
*Gen. A. Cantore ..		1921 1922	240½	24	9·0	2	635	18,000	31-33	{ 3 4-in., 23-in. A.A. }	4	100	— 150
*Gen. A. Chinotto ..													
*Gen. A. Papa ..													
*Gen. A. Cascino ..	Yarrow ..	1918	287	27·5	8·3	2	630	21,500	34·5	{ 7 4-in., 1 2-pr. A.A., 2 M.	2 dbl.	111	— 262
*Gen. M. Prestinari ..													
*Gen. C. Montanari ..													
Audace (ex-Kawa- kaze) .. .. .													
Ardimentoso, ex-S. 63 .. ..	Schichau ..	1915	274	27·3	8·6	2	803	22,000 t	25 t	{ 3 3·9-in., 2 3-in., 24 mines }	4	98	— 305
Solferino, Palestro S. Martino, Curtatone Confienza, Castelfi- dardo, Calatafimi, Monzambano ..	{ Leghorn } { (Orlando) }	{ 1921 1922 1923 }	269 283½	26·5	8·6	2	{ 860 966 }	18,000	32- 33·5	{ 4 4-in., 2 3-in. A.A., 2 M., 24 mines }	4	..	— 170
Cortellazzo .. ..	{ Danubius ex-Austrian }	{ 1917 1913 }	274	25·5	8·2	2	{ 561½ 594 }	17,000	32	{ 2 3·9-in. 4 3-in.	4	102	110 140
Grado .. .. .													
Monfalcone .. ..													
Zenson (ex-Pola) ..													
TORPEDO BOATS—													
A.S. 56, 57 .. ..	Ansaldo ..	{ 1916- 1918 }	139·5	15	5·5	2	{ 133½ 169 }	3,400	28-29	2 3-in. A.A.	2	..	..
O.L.T., 74, 75 ..	Orlando ..												
SUBMARINES—													
Diamante .. .. .	Taranto ..	{ Bldg.	..	..	..	2	590	1,350	14	1 3·9-in.	8	..	..
Smeraldo .. .. .	Fiume ..						787	800	8·4				
Rubino & Topasio ..	Orlando ..						880	3,000	17·5	1 3·9-in.	8	..	..
Zaffiro & Amestista ..	Orlando ..						1231	1,300	8·5				
Serena, Naiade, Nereide, Anfritrite, Galatea, Ondina 4 ("Settembrini" class) .. .. .	Monfalcone						862	3,000	17·0	1 3·9-in.	8	..	..
2 ("Squalo" class)	Monfalcone	Bldg.	..	..	..	2	1167	1,040	8·5	1 3·9-in.	8	..	..
3 ("Balilla" class)	Spezia ..	Bldg.	..	..	..	2	1333	4,400	17	1 4·7-in., 1 smaller	8	..	..
1 (Minelayer) ..	Taranto ..	Bldg.	..	..	..	..	1965	1,800	8·75	1 4·7-in., 1 smaller	6	..	..
Squalo, Narvalo, Delfino, Tricheco ..	Cantiere N., Triestino ..	1930	228	18·8	15·5	..	1371	3,200	16·0	1 4·7-in., 1 smaller	6	..	..
Argonauta, Fisalia, & Medusa .. ..	Cantiere N., Triestino ..	1931	..	..	..	..	1883	1,500	8·5	1 4·7-in., 1 smaller	6	..	..
Jalea & Jantina ..	Odero-Terni	1932	200	18·8	13	..	599	1,200	14	1 4-in.	21-in.	..	..
Serpente (ex-Nauti- lus) & Salpa .. ..	Taranto						778	900	8·5				
Santorre Santarosa Ciro Menotti .. ..	Ansaldo ..	1929	230	19	15·5	..	815	3,000	17·5 9	1 4-in.	8	..	..
Fratelli Bandiera ..	Monfalcone	1929					1078	1,360					
Luciano Manara ..	Taranto ..	1930					797	3,000					
Luigi Settembrini ..	Taranto ..	1930					1134	1,400					
Ruggiero Settimo ..	Taranto ..	1930					1340	6,000	19	1 4·7-in.	8	..	..
E. Fieramosca ..	{ Taranto (Tosi) }	1930	277	27	16·8	..	1760	2,000	10	1 3·9-in.,	8	..	80
M. Bragadino .. ..	Taranto	1929	233	18·6	14	2	802	1,500	14	1 4-in.,	4	..	..
F. Corridoni .. ..	(Tosi)	1930					1021	1,900	8	24 mines	4	..	41
Ballila .. .. .	Spezia, ..	1927					1368	4,400	18·5	1 4·7-in.	6	..	..
A. Sciesa .. .. .	Ansaldo	1928					1874	2,200	10				140
E. Toti .. .. .		1927					791	3,000	17·5	1 4-in.	6	..	..
D. Millelire .. ..	Montfalcone, Trieste	1928	223	18·7	13·8	..	1040	1,000	9	1 M.	21-in.	..	48
V. Pisani .. .. .		1928	213·3	21·5	13	..	770	3,000	17·5	{ 1 4-in. }	6	..	..
M. Colonna .. ..	Taranto ..	1927					977	1,000	9				
Da. Geneys .. ..		1928											
G. Bausan .. .. .		1926											
G. Mameli .. .. .		1927											
P. Capponi .. .. .	Taranto ..	1928	211·7	20·3	15·6	..	780	2,600	17	{ 2 3-in., 1 M.	6	32	— 50
Speri .. .. .		1928					900	1,300	10				
G. Da. Procidia ..		1928					708	2,600	17				
L. Mocenigo .. ..	Venice ..	1918					909	1,300	10				
A. Emo .. .. .		1919					390	650	10				
L. Galvani .. .. .							460	320	6·3	{ 1 3-in. A.A. 1 M., 18 mines }	2	..	— 8
G. Nani .. .. .	{ Spezia, F.I.A.T. }	1917	218·0	19·3	14	..	336	620	13	{ 1 3-in. A.A. 1 M.	4	22	— 18
X 2, 3 .. .. .	Ansaldo ..	1916	139·9	18	11	..	242	670	12·5	1 3-in. A.A.	2	..	— 12
H 1, 2, 3, 4, 6, 8 ..	Vickers ..	1917	150·3	15·8	12	..	313	250	8	1 3-in. A.A.	2	22	— 12
F 6, 13, 20 .. ..	F.I.A.T. ..	1916	149·6	13·8	10	..	262	650	12·5	(1 3-in. A.A.)	2	..	..
N 3, N 4 .. .. .	Ansaldo ..	1916	150·5	14	9·9	..	357	360	8	1 M.	18-in.	..	9
N 6 .. .. .	Taranto ..	1917											

\* Designated torpedo boats in Italian official list.

## Japan.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS :													
FIRST CLASS—													
No. 59 .. .. .	Sasebo .. .. .	Bldg. .. .. .	..	..	..	..	1378	..	..	5-in. guns	..	..	..
No. 60 .. .. .	Uraga .. .. .												
No. 61 .. .. .	Sasebo .. .. .												
Oboro .. .. .	Sasebo .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Akebono .. .. .	Fujinagata .. .. .												
Sazanami .. .. .	Maizuru .. .. .												
Ushio .. .. .	Uraga .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Akatsuki .. .. .	Sasebo .. .. .												
Hibiki .. .. .	Maizuru .. .. .												
Ikazuchi .. .. .	Uraga .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Inazuma .. .. .	Fujinagata .. .. .												
Sagiri .. .. .	Uraga .. .. .												
Asagiri .. .. .	Sasebo .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Yugiri .. .. .	Maizuru .. .. .												
Amagiri .. .. .	Tokyo .. .. .												
Shikunami .. .. .	Maizuru .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Ayanami .. .. .	Fujinagata .. .. .												
Fubuki .. .. .	Maizuru .. .. .												
Shirayuki .. .. .	Yokosuka .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Hatsuyuki .. .. .	Maizuru .. .. .												
Miyuki .. .. .	Uraga .. .. .												
Murakumo .. .. .	Fujinagata .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Shiunome .. .. .	Sasebo .. .. .												
Usugumo .. .. .	Ishikawa .. .. .												
Shirakumo .. .. .	Jima (Tokyo) .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Isanami .. .. .	Fujinagata .. .. .												
Uranami .. .. .	Uraga .. .. .												
Minadzuki .. .. .	Sasebo .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Fumiteuki .. .. .	Uraga .. .. .												
Nagatsuki .. .. .	Fujinagata .. .. .												
Kikudzuki .. .. .	Ishikawajima .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Mikadzuki .. .. .	Maizuru .. .. .												
Uchidzuki .. .. .	Sasebo .. .. .												
Yayoi .. .. .	Maizuru .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Udzuki .. .. .	Fujinagata .. .. .												
Mut-uki .. .. .	Uraga .. .. .												
Kisaragi .. .. .	Ishikawajima .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Satsuki .. .. .	Sasebo .. .. .												
Oite .. .. .	Maizuru .. .. .												
Hayate .. .. .	Fujinagata .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Yunagi .. .. .	Ishikawajima .. .. .												
Kamikaze .. .. .	Sasebo .. .. .												
Asakaze .. .. .	Nagasaki .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Hanukaze .. .. .	Maizuru .. .. .												
Matsukaze .. .. .	Maizuru .. .. .												
Hatakaze .. .. .	Fujinagata .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Asanagi .. .. .	Kobe .. .. .												
Amatsukaze .. .. .	Kure .. .. .												
Tokitsukaze .. .. .	Kure .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Isokaze .. .. .	Nagasaki .. .. .												
Hanukaze .. .. .	Maizuru .. .. .												
Tanikaze .. .. .	Yokosuka .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Kawakaze .. .. .	Maizuru .. .. .												
Sawakaze .. .. .	Yokosuka .. .. .												
Okikaze, Shimakaze, Nadakaze, Yukaze, Hukaze, Minekaze, Namikaze, Numakaze, Nokaze, Tashikaze, Shiokaze, Hokaze, Yakaze, Akikaze .. .. .	Nagasaki .. .. .	1929-1930	368 p.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	210	..
Urakaze .. .. .	Maizuru .. .. .												
Yarrow .. .. .	Mitsubishi, Kawasaki, Maizuru .. .. .												
SECOND CLASS —													
Wakatsuki .. .. .	Kawasaki .. .. .	1929-1930	287·3	27·6	9·5	—	810	21,000	28	{ 1 4·7-in., 4 3-in.	4	21-in.	—
Kuretake .. .. .	Kobe .. .. .												
Fuyo .. .. .	Fujinagata .. .. .												
Karukaya .. .. .	Ishikawa .. .. .	1929-1930	275	26·5	8·3	..	820	21,500	31·5	{ 3 4·7-in., 2 M. A.A.	4	110	— 250
Asagao .. .. .	Jima .. .. .												
Yugao .. .. .	Uraga .. .. .												
Sanaye .. .. .	Sasebo .. .. .	1929-1930	275	26·5	8·3	..	820	21,500	31·5	{ 3 4·7-in., 2 M. A.A.	4	110	— 250
Sawarabi .. .. .	Maizuru .. .. .												
Yanagi .. .. .	Kure .. .. .												
Kashi, Hinoki .. .. .	Sasebo .. .. .	1929-1930	275	26·5	8·3	..	820	21,500	31·5	{ 3 4·7-in., 2 M. A.A.	4	110	— 250
Kuwa, Tsubaki .. .. .	Maizuru .. .. .												
Maki, Keyaki .. .. .	Sasebo .. .. .												
Momi, Kaya .. .. .	Yokosuka .. .. .	1929-1930	275	26·5	8·3	..	820	21,500	31·5	{ 3 4·7-in., 2 M. A.A.	4	110	— 250
Nashi, Kaki, Take .. .. .	Kawasaki .. .. .												
Kuri .. .. .	Kure .. .. .												
Nire, Tauga .. .. .	Ishikawa .. .. .	1929-1930	275	26·5	8·3	..	820	21,500	31·5	{ 3 4·7-in., 2 M. A.A.	4	110	— 250
	Jima .. .. .												
	Jima .. .. .												

## Japan—continued.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement	Fuel
			Length (extreme).	Beam.	Draught.								Coal Oil
DESTROYERS—contd.													
Second class—contd.													
Hagi	Uraga	1920-1922	275·5 p.p.	26	8	2	770	21,500	31·5	{ 3 4·7 in. } { 2 m., A.A. }	4 21-in.	80	— 290
Susuki, Yomogi	Ishikawa												
Sumire	Jima												
Hishi, Hasu	Uraga												
Tade, Fuji	Fujinagata												
Aoi, Kiku	Kawasaki												
Tsuta, Ashi													
TORPEDO BOATS—													
No. 1	Maizura	Bldg. projected.	254	..	..	..	527	..	..	..	..	..	..
No. 2	Osaka												
Two more, Nos. 3	and 4 are pro												
SUBMARINES—													
I68	Kure	Bldg.	331	27	13	..	1400	..	..	1 5 in.	..	..	..
I69	Kobe												
I5	Kawasaki	1932	..	..	..	..	1955	6000	17	2 5·5-in.	6	60	..
I65	Kure	1931	3 21	25·6	15·9	..	1638	6000	19	1 4-in.	6	..	..
I66	Sasebo												
I67	Kobe	1929	320½	26	16	..	1635	6000	21	1 4·7 in.	8	56	255
I59	Yokosuka												
I61	Mitsubishi	1929	p.p.	..	..	..	2100	1800	7·9	..	..	..	..
I62	Kobe												
I64	Kure	1929	320	30·2	15·7	..	1955	6800	17	{ 2 5 5 in. } { 1 m. }	6	61	520
I57	Kure												
I4	Kawasaki	1929	p.p.	24·6	14	..	1142	2400	14	1 5·5-in.	4	45	..
I1, I2, I3	Kawasaki												
†I21	Kure	1927	p.p.	24·6	14	..	1470	1200	9·5	..	..	..	..
†I22	Kure												
†I23	Kure	1929	p.p.	26	16	..	1635	6000	21	1 4·7-in.	8	56	255
†I24	Kure												
I53	Kure	1927	p.p.	26	16	..	2100	1800	7·9	..	..	..	..
I55	Kure												
I56	Kure	1929	p.p.	26	16	..	1635	6000	21	1 4·7-in.	8	56	255
I54	Sasebo												
I63	Sasebo	1928	p.p.	26	16	..	1635	6000	21	1 4·7-in.	8	56	255
I60	Sasebo												
I58	Yokosuka	1928	243½	20	12·4	..	655	1200	17	1 3-in.	6	43	75
Ro. 31	Mitsubishi												
Ro. 65	Mitsubishi	1926	250	24·2	12·4	..	988	2400	16	1 3-in.	6	47	75
Ro. 66	Mitsubishi												
Ro. 67	Mitsubishi	1927	330	25	16·8	..	1390	6000	19	1 4·7-in.	8	..	190
Ro. 68	Mitsubishi												
I. 51 †	Kure	1924	250	24·2	12·4	..	988	2400	16	1 3-in.	6	47	75
I. 52	Kure												
Ro. 64	Mitsubishi	1925	250	24·2	12·4	..	1300	1800	10	1 3-in.	6	47	75
Ro. 63, 62, 61	Mitsubishi												
Ro. 60	Mitsubishi	1923	243·5	20	12·4	..	655	1200	13	1 4-in.	4	43	75
Ro. 32, 30	Kawasaki												
Ro. 29	Kawasaki	1923	230	20·1	12	..	746	2600	16	1 3-in.	4	..	75
Ro. 28	Sasebo												
Ro. 27	Yokosuka	1924	250	23·5	13	..	1000	1200	10	1 3-pr.	21-in.	..	..
Ro. 26	Sasabo												
Ro. 59	..	1923	250	23·5	13	..	889	2400	17	1 3-in.	4	65	76
Ro. 58, 57	..												
Ro. 25, 19, 18, 17	Sasebo, Kure	1921	230	20	12·2	..	735	2600	17	1 3-in.	6	..	..
Ro. 24	Sasebo												
Ro. 23	Yokosuka	1923	231·5	23·5	13	..	1082	1200	10·5	1 3-pr.	18-in.	65	76
22, 21, 20, 16	{ Yokosuka, } { Kure }												
Ro. 56, 55	Mitsubishi	1922	230	20	12·3	..	736	2600	17	1 3-in.	6	48	..
54, 53	Mitsubishi												
51	Mitsubishi	1920	230	20	12·3	..	736	2600	17	1 3-in.	6	48	..
Ro. 15, 14	{ Kure } { Kure }												

Submarines projected:—I6 (1900 tons), I70-73 (1400 tons), A and B (700 tons).

† Fitted for minelaying.

‡ Carries small seaplane.



## Netherlands.

Name or Number.	Where built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-power.	Maximum speed.	Armament.	Torpedo Tubes.	Complement.	Fuel
			Length. (Extreme.)	Beam.	Draught.								Coal. Oil.
DESTROYERS—													
*Banckert ..	Burgerhout	1929								4 4·7-in., 1 3-in. A.A.,	6 21 -in.	130	— 330
*Van Nes ..	Rotterdam	1930	321·5	31	9·8	2	1620	31,000	34	4 1-pr., 4 M.			
*Vau Galen	Fijenoord	1928								1 seaplane			
*Witte de With	Rotterdam	1928								24 mines			
*De Ruyter	Flushing	1926	321·5	31	9·8	2	1620	31,000	34	4 4·7-in.	6 21 -in.	126	— 330
*Evertsen ..	Rotterdam	1926								2 3-in. A.A.			
*Piet Hein ..		1927								24 mines			
*Kortenaer		1927								1 seaplane			
1ST CLASS TORPEDO BOATS—													
†Zeeslang,	Flushing	1907	130	13·8	6·9	1	104	{1200— 1560}	24	2 1-prs.	2	20	20
†Krokodil,		1906											
†Draak,	{Scheldt Fijenoord}	1906	162·5	17·3	9·0	..	180	2,600	25	2 3-in.	3	25	40
G 13, 15 and 16 ..		1913—1914											
Z 1-4 ..	Amsterdam	{1916— 1917}	201	20·4	6	2	322	5,500	27	2 3-in., 2 M.	4	39	61 8
Z 5-8 ..	{Scheldt Fijenoord}	1915											
†G 12 and 2	..	1903-7	..	..	..	..	112	..	..	2 4-prs.	3	..	..
SUBMARINES—													
K XIV ..	Rotterdam	Bldg.	242	21·5	13·3	..	Surf. Sub. 810 1,000	3000	17 9	1 3·5-in., 2 1·5-in.	6	..	..
K XV ..		1932											
K XVI ..	Fijenoord	Bldg.	..	..	..	..	..	..	..	..	..	..	..
K XVII ..		1932											
K XVIII ..	De Schelde	1931	19·9	18·7	11·5	..	560 700	2,900 —	15 8	2 1·5-in. A.A.	5	..	..
O 12 ..		1931											
O 13 ..	Amsterdam	1925	179½	18·7	11½	..	506 627	900 —	12½ 9	1 22-pr. A.A. 1 maxim	5	29	21
O 14 ..		1924											
O 15 ..	Fijenoord	1924	218·8	20·2	12·2	..	660 810	2,400 —	15 8	1 22-pr., 1 maxim	6	31	45
O 10 ..		1925											
†K XIII ..	Fijenoord	1925	179½	18·7	11½	..	506 627	900 —	12½ 9	1 22-pr. A.A., 1 maxim	5	29	21
†K XII ..		1925											
O 11 ..	Flushing	1925	179½	18·7	11½	..	506 627	900 —	12½ 9	1 22-pr. A.A., 1 maxim	5	29	21
O 9 ..		1925											
O 8 ..	..	1914	150·3	15·8	12·3	..	364 434	480 320	13 8·5	1 maxim	4	26	18
(ex-British H6)		1914											
M1	Hamburg	1915	111½	10·3	9	..	157 176	80 155	7½ 5	1 4-pr. 12 mines	—	16	2½
(ex-German UC 8)		1915											
O 7 ..	Fijenoord	1916	112	12·8	9·5	..	177 206	350 185	11·5 8·5	1 maxim	3	12	— 5·4
O 6 ..	De Schelde	1916	115·9	12·8	9·5	..	187 226	350 185	11·5 8·5				
O 5 ..	De Schelde	1913	105·3	10·2	9·5	..	129 147	300 170	11 8·5	1 maxim	2	10	— 3·6
O 4 ..	De Schelde	1913											
O 3 ..	De Schelde	1912											
†K X ..	De Schelde	1923	212	18·3	11·9	..	560 690	1,550 630	15 8	1 22-pr. 1 maxim	4	29	— 45
†K IX ..		1922											
†K VIII ..	Fijenoord	1922	177·2	16·8	12·5	..	550 630	1,200 600	15 8	1 3-in., 1 maxim	6	29	— 76
†K VII ..		1921											
†K VI ..	De Schelde	1920	211·3	18·3	11·5	..	560 700	1,200 600	15 8	1 3-in., 1 maxim.	6	29	— 45
†K V ..		1919											
†K IV ..	Fijenoord	1920	172·3	16·8	12·5	..	550 600	1,800 600	15 8	1 3-in., 1 maxim	6	29	— 76
†K III ..		1919											
†K II ..	Fijenoord	1919	172·3	16·8	12·5	..	550 600	1,800 600	15 8	1 3-in., 1 maxim	6	29	— 76

Two flotilla leaders are projected but no money voted. Four destroyers, Nos. IX-XII are projected but no money voted. Eight submarines, O 16 and O 17, K XIX, K XX, K XXI, K XXII, KXXIII, K XXIV, are projected but no money voted.

\* Dutch East Indian Fleet.

† Indian Military Marine.

‡ For harbour service only.

## Norway.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme)	Beam.	Draught.								Coal Oil
<b>DESTROYERS—</b>			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Draug, Troll, Garm	Horten ..	1908-13	226	23·5	8·8	2	540	7,500	27·0	6 3-in. Draug has 6 4·7-in. in addition 2 3-in.	3 18 -in.	71	95 6
<b>TORPEDO BOATS:</b>													
<b>FIRST CLASS—</b>													
Snogg, Stegg, Trygg	Horten ..	1919- 1920	173·9	18	5½	2	250	3,500	25		4	31	30
Hval .. .. .	Eibing ..	1896- 1900	130·0	16·0	6·9	1	100	1,100	21	2 M.	2	19	17
Storm, Brand	Horten ..	1901	126·4	15·0	6·9	1	110	1,150	21·8	2 M.	2	19	—
Lake, Sild, Sael, Skret	Horten ..												
<b>SECOND CLASS—</b>													
Kjek, Hvas, Kvik, Blink	Fredrikstad	1898	114·5	14·5	6·0	1	73	750	19	2 M.	2	14	11
Lyn, Hauk, Falk ..	Horten ..	1903											—
Skarv, Teist .. ..	Horten ..	1906-7	133	14·9	6·5	1	100	1,600	25	2 3-pr.	2	18	16
Lom, Jo, Grib .. ..	Horten ..	1903	117	14·5	5·7	1	72	1,100	23	2 M.	2	16	15
Ravn, Orn .. .. .	Horten ..	1903	113	14·5	5·7	1	73	850	23	2 M.	2	16	—
Kjell .. .. .	Horten ..	1912	135	14·9	6·4	1	100	1,800	25	2 3-pr.	2	19	15 16
<b>SUBMARINES—</b>													
A 2, 3, 4 .. .. .	Germania Kiel	1909 to 1913	133·2	15·7	8·9	2	246 332	900 380	14 7	—	3	17	— 12·5
B 1, 2 .. .. .	Horten ..	1922											
B 3, 4 .. .. .	Horten ..	1923-24	167·3	17·5	10·5	2	413- 545	900 —	14·5 10	1 12-pr.	4	23	15 21
B 5, 6 .. .. .	Horten ..	1929											

3 destroyers (1000 tons, 32 knots, 3 4·7-in. guns), 6 torpedo boats (350 tons), and 10 submarines (500 tons), projected.

## Soviet Union.

Some of the details given below are uncertain.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme)	Beam.	Draught.								Coal Oil
<b>DESTROYERS—</b>			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Dzerzhinski and 2 others .. .. .	..	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Felix Dzerzhinski	Ship & Eng. Co., Niko- laev	1917	303·5	29·5	10·5	..	1326	29,000	33	4 4-in., 2 7-pr., 4 M. can carry 80 mines	12	120	390
Petrovskii ..													
Nesamojini ..													
Shaumyan ..	Revel ..	1915	344·5	31·3	9·7	..	1350	32,700	35	5 4-in., 1 3-in., carries mines	..	110	400
Karl Marx ..													400
Kalinin ..													400
Uritsky ..	Leningrad ..	1914	321·5	30·5	9·25	..	1610	32,000	35			110	—
Volodarski ..													—
Rykov ..		1914											—
Engels ..													—
Stalin ..	Leningrad ..	1915	314·75	30·5	9·75	..	1260	30,000	35	4 4-in., 1 3-in., 2 M., 80 mines	9	110	350
Volkov-Trotsky													—
Lenin ..													—
Bezpekoini* ..	Nikolaev ..	1913-14	307·7	29·5	9	..	1088	25,500	31	3 4-in., 2 3-pr., 4 M.	10	140	260
Gayevni* ..													—
Peraki* ..													—
Pospyashni* ..	Leningrad ..	1913-14	321·5	30·5	9·8	..	1100	23,000	34	3 4-in., 2 3-pr., 4 M., 80 mines	10	120	361
Paiki* ..													—
Fruuze .. .. .	Leningrad ..	1914	336	31·1	9·8	..	1200	33,000	32	4 4-in., 1 3-in., 4 M.	8	..	..

\* Under French protection at Bizerta.

Soviet Union—*continued.*

Name or Number.	Where Built.	Date of Completion.	Dimensions.			Number of Screws.	Displacement. Surf/Sub.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.	
			Length. (Extreme.)	Beam.	Draught.								Coal	Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.	
<b>SUBMARINES—</b>														
B4 and 5 .. .. .	Nikolaiev .. Sevastopol }	Bldg.	..	..	..	..	1100	1500	12	13-in. 1 1-pr.	4	..	..	..
Revoluzioner .. ..							—	1200	—					
Yakobinetz .. .. .														
Spartakovetz .. ..														
Dekabrist .. .. .		1931	279	23	16½	..	1000	..	15	1 3-in.	..	..	..	..
Narodvoletz .. ..									10					
Politrabotnik (ex-Ag 26) .. ..		1924	150½	15½	5½	..	355	480	13	1 6-pr.				
Marxist (ex-Ag 25) .. ..		1922					467	320	11					
Kommunist(ex-Ag 24) .. ..		1922	150½	15½	15½	..	375	480	13	1 6-pr.	4	..	..	..
Shakter (ex-Ag 23), Ag 22* .. .. .		1920	..	..	..	..	467	320	11					
Proletary .. .. .		1916					..	..	13	1 4-in., 2 M.	6	..	—	17
									7.5					
Rabotchky .. .. .		1917	223	14.5	12.5		2640	16	16	1 6-pr., or 2 6-pr., 1 M.	4	33	—	40
							900	9	9					
Tyulen* .. .. .		1915					900	9	9					
Politrak .. .. .		1913	220	14.5	12.7		500	10	10	1 4-in., 1 6-pr., 2 M.	4	52	—	2
Utka* .. .. .		1916					1400	11.7	11.7					
			223	14.5	12.5		650	500	10	2 11-pr., 1 1-pr., 1 M.	4	52	—	40
Burysevyestnik* .. ..		1918					784	900	9					
							2640	16	16					
Batrak .. .. .		1917	..	..	..		900	9	9	1 11-pr.	4	..	..	..
Krasnoarmeyets .. ..		1917					2640	16	16	2 6-pr., 1 1-pr.	4	..	..	..
Komissar .. .. .		1916					900	9	9					
Bolshevik .. .. .		1916	223	14.5	12.6		500	10	10	2 6-pr., 1 1-pr., 1 M.	4	33	—	40
Komunar (ex-Tigr) .. ..		1916					900	9	9					
Tovaristch .. .. .		1916					900	9	9					
Krasnoflotetz .. ..		1916					900	9	9					
Bedryak (ex-British L55) (raised from Baltic) .. .. .		..	230 b.p.	23.5	13.2	..	900	2400	17.5	2 4-in. guns	6	..	—	78
							1150	1600	10.5					

In addition to the above one or more other submarines are understood to be building or authorised. \* Under French protection. There are about thirty-five destroyers and torpedo-boats completed from 1895 to 1912 of very little if any fighting value. Many of the above vessels are known to be practically useless until very extensively repaired and refitted.

## Spain.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.	
			Length. (Extreme.)	Beam.	Draught.								Coal	Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.	
<b>FLOTTILLA LEADERS—</b>														
Almirante Valdés ..	Cartagena ..	Bldg.												
" Antequera ..														
" Miranda ..														
Churruca (No. 45) ..		1929												
Alcala Gallano (No. 46) ..		1930												
Lepanto (No. 44) ..		1928	331½	31.7	10.5	2	1,650	42,000	36	5 4.7-in. 13-in. A.A. 4 M.	6	..	—	540
Almirante Ferrandiz (No. 42) ..		1928												
José Luis Díez (No. 43) ..	Cartagena ..	1928												
Sanchez-Barcaiztegui ..	Cartagena ..	1926												
<b>DESTROYERS—</b>														
Alsido .. .. .	Cartagena ..	1922												
Velasco .. .. .		1923	283	27	10.5	2	1,145	33,000	34	3 4-in., 2 2-pr. A.A.	4	70	—	265
Juan Lazaga .. ..		1924												
Villaamil* .. .. .	Cartagena ..	1913	221½	22½	5.6	..	364	6,250	28	5 6-pr.	4	70	80	—
											18-in.			
<b>TORPEDO BOATS—</b>														
12 boats .. .. .	Cartagena ..	1913-1922	164	16.5	4.9	3	177	3,750	26	3 3-pr.	3	31	33	—
											18-in.			
<b>SUBMARINES—</b>														
C 2-6 .. .. .	Cartagena ..	1928					900	2000	16	1 4-in., 1 3-in. A.A.	6	..	..	..
Isaac Peral (ex-C 1) ..		(1929)	240	20.8	13.5	..	1270	750	9		21-in.			
B 1-6 .. .. .	Cartagena ..	1921-24	210	18.9	11.25	..	560	1400	16	1 3-in.	4	28	—	66
							830	850	10.5		18-in.			
A 1, 2 .. .. .							185	..	..					

12 submarines are authorised (1926 programme).

5 flotilla leaders, Nos. 47 to 51 (1536 tons), are projected.

\* Minelayers.



## Sweden.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
Klas Horn .. ..	Malmö	1931	303·2	29·2	10·5	..	881	26,000	35	{ 3 4·7-in., 2 2-prs. A.A., 2 M.	2 trpl. 21-in.	125	— 150
Klas Uggla .. ..	Karlskrona												
Nils Ehrensköld ..	Göteborg	1926	216	20·8	9	2	354	6,000	30	{ 6 6-prs., 2 3-in., 4 6-prs. A.A., 2 M.	2 ..	..	..
O. H. Nordenskjöld	Malmö												
Magne .. ..	Thornycroft	1905	216	20·8	9	2	354	6,000	30	6 6-prs.,	2	..	..
Wale .. ..	Malmö ..	1906	216	20·8	9	2	354	8,000	30	2 3-in., 4 6-prs.	2	..	..
Ragnar .. ..	Malmö ..	1909	216	20·8	9	2	351	{ 8,000— 9,000 }	30·0	{ 4 3-in., 2 M.	{ 2 dbl.	67	80 —
Sigurd .. ..	Gothenburg	1909											
Vidar .. ..	Malmö ..	1909											
Hugin .. ..	Gothenburg	1909											
Munin .. ..	Malmö ..	1910	232·8	22	9·2	2	458	11,000	34·0	4 3-in., 2 M.	6	72	107 6
Wrangel † .. ..	Gothenburg	1917											
Wachtmeister † ..	Gothenburg	1917											
* TORPEDO-BOATS—													
1st Class—													
Castor, Pollux .. ..	{ Normand & Carlskrona }	1908	128	14·5	8·5	1	103	2,000	25	{ 2 1-prs. 2 6-prs.	2	18	20 —
Vega .. ..	Carlskrona ..	1909											
Vesta .. ..	Carlskrona ..	1909											
Spica, Astrea, Iris, Thetis .. ..	{ Bergsund and Gothenburg }	1909											
Altair .. ..	Stockholm ..	1908	128	14·5	8·5	1	103	2,000	25	{ 2 1-prs. 2 6-prs.	2	18	20 —
Antares .. ..													
Argo .. ..													
Arcturus .. ..													
Perseus, Polaris ..	Bergsund ..	1910	128	14·5	8·5	1	103	2,000	25	{ 2 1-prs. 2 6-prs.	2	18	20 —
Regulus, Rigel ..	Stockholm ..	1915											
SUBMARINES—													
1st Class—													
Ulven .. ..	Naval Yard, Karlskrona	1930	217	21	10·8	..	700	2800	16	1 4-in., 1 M.	4 20-in.	..	— 40
Draken .. ..		1926					850	—	9				
Gripen .. ..		1928					850	—	9				
Bavarn .. ..	Naval Yard, Karlskrona	1921	187	19·4	9·2	..	500	2800	15	1 3-in., 1 M.	4	..	— 33
Illern .. ..							650	—	9				
Uttern .. ..							650	—	9				
Svärdfisken .. ..	Kockum Co., Malmö	1914	137·7	12·5	9·8	..	300	800	15	1 6-pr.	2	..	— 8
Tumlarern .. ..							300	800	15				
Sälen .. ..	Kockum Co., Malmö ..	1920	177·2	16·2	11·2	..	450	..	..	1 3-in., 1 M.	4	..	— 23
Valrossen .. ..							580	..	..				
Hajen .. ..	Malmö ..	1920					580	..	..				
Minelaying Sub.—													
Valen .. ..	..	1925	187·2	23·2	9·4	..	500	..	..	1 3-in., 1 M.	4	..	— 34
2nd Class—													
Aborren .. ..	Karlskrona D. Y. ..	1914-15	{ 101·7 88·6 }	11·7	10·2	..	173	..	..	..	2	..	6·5 — 4·0
Braxen .. ..							173	..	..				
Laxen .. ..							173	..	..				
Gäddan .. ..	..	1914-15	88·6	11·7	10·2	..	133	..	..	..	1	..	4·0

† Fitted for mine-laying.

\* Also six small 2nd class torpedo-boats, Nos. 5-9, 14, 60 tons, built 1907-1908, and two motor torpedo-boats, Nos. 3 and 4. Two minelaying submarines B 1 and B 2, 502 tons, are building.

## United States.

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
<b>DESTROYERS—</b>													
Farragut ..	Bethlehem S.B. Co.	Bldg.	..	..	..	..	1,500	..	36½	6 5-in.	..	..	..
Dewey ..	Bath, I. W. Co.												
Hull ..	Navy Yard, N.Y.												
MacDonough	Navy Yard, Boston												
Worden ..	Navy Yard, Puget Sound												
Pruitt ..	Bath, I. W.	1920											
Sicard ..		1920											
Preble ..													
William B. Preston	Norfolk, N.W.	1921											
Noa ..	Navy Yard, Mare Is.	1920											
Hulbert ..		1922											
Decatur ..		1922											
Perry ..	Navy Yard, Mare Is.	1922											
Trever ..		1921											
Wasmuth ..		1921											
Zane ..	..	1920											
Litchfield													
Marcus ..	Bethlehem S.B. Co., Squantum	1921											
Sloat ..		1920											
Meade ..													
Swasey ..		1919											
Tingey ..													
Morris ..													
Thornton ..													
Bailey ..													
Shubrick ..													
Ballard ..	Bethlehem S.B. Co., Quincy												
Greene ..													
Edwards ..													
McLanahan													
Laub ..													
Gillis ..													
Turner ..													
Aulick ..													
Welles ..													
Bancroft ..													
Osmond Ingram													
Rodgers ..													
McCalla ..													
McCook ..													
Belknap ..													
Lawrence ..													
Hopkins ..													
Barry ..													
Goff ..													
Bainbridge ..													
Reuben James													
Williamson													
Sands ..													
King ..													
Childs ..													
Sturtevant ..													
Overton ..													
James K. Paulding													
McFarland ..													
Humphreys													
Kane ..													
Fox ..													
Gilmer ..													
Brooks ..													
Hatfield ..													
Paul Jones													
Truxton ..													
John D. Ford													
Pillsbury ..													
Peary ..													
Pope ..													
Stewart ..													
McCormick													
Bulmer ..													
Simpson ..													
MacLeish ..													
Edsall ..													
Parrott ..													
Whipple ..													
J. D. Edwards													
Borle ..													
Tracy ..													

Five destroyers of 1500 tons and one flotilla leader of 1850 tons are projected.

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Oil.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
<b>DESTROYERS—<i>continued.</i></b>													
Barker ..													
Smith Thompson ..													
Alden ..													
Broome ..		1919						26,000	..	Long and Hovey have 8 4-in. in twin mtgs. and 1 3-in. A.A.			
Long ..													
Hovey ..													
Southard ..													
Chandler ..													
Dallas ..													
*Hendon ..													
*Branch ..													
*George E. Badger ..		1920	314.4	31	9.8	..	1,190		35	4 4-in., 1 3-in. A.A. Semmes has a 5 4-in.	4 triple	122	375
*Welborn C. Wood ..	Newport News S.B. Co.	1921											
*Hunt ..		1920						25,000					
*Abel P. Upshur ..		1920											
Mason ..		1920											
Satterlee ..		1919											
Semmes ..													
Goldsborough ..		1920											
Dahlgren ..													
Clemson ..		1919											
Bagley ..													
Abbot ..													
Haraden ..		1919	314.4	31	9.8	..	1,060	25,000	35	4 4-in., 1 3-in. A.A.	4 triple	122	286
Thomas ..													
Hopewell ..		1920											
Stansbury ..		1920											
Howard ..													
Hogan ..	Union I.W.												
O'Bannon ..													
Renshaw ..													
Mackenzie ..													
Kalk ..													
Foote ..													
Maddox ..		1919	314.4	31	9.8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple	122	283
Cowell ..	Fore River S.B. Co.												
Bush ..													
Meredith ..													
Crosby ..													
Walker ..													
Thatcher ..		1918											
Palmer ..													
Herbert ..													
Schenck ..	N.Y. S.B. Co.		314.4	31	9.8	..	1,000	26,000	35	4 4-in., 1 3-in. A.A.	4 triple	122	286
Leary ..													
Dickerson ..													
J. Fred Talbot ..													
Cole ..													
Ellis ..													
Bernadou ..		1919											
Dupont ..													
Biddle ..													
Blakeley ..	Cramp, Phil.		314.4	31	9.8	..	1,000	26,000	35	4 4-in., 1 3-in. A.A.	4 triple	122	286
Barney ..													
Breckenridge ..													
Roper ..													
Elliot ..													
Greer ..													
Upshur ..		1918											
Yarnall ..													
Tarbell ..													
Hamilton ..		1919											
Claxton ..		1919											
Ward ..	Mare Island, N.Y.	1918											
Kennison ..		1919											
† Kilty ..		1918											
† Boggs ..		1918	314.4	31	9.5	..	..	24,000	35	4 4-in., 1 3-in. A.A.	4 triple	122	286
Tillman ..		1921						26,000					
Crowninshield ..													
Hale ..	Bath I.W.												
Aaron Ward ..		1919											
Buchanan ..													
Jacob Jones ..													
Babbitt ..													
Twiggs ..	New York S.B. Co.		314.4	31	9.8	..	1,000	26,000	35	4 4-in., 1 3-in. A.A.	4 triple	122	286
Badger ..													
Tattnall ..													

\* Operated by the U.S. Coast Guard.

† Equipped as targets.



## United States—continued.

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
<b>DESTROYERS— continued.</b>													
Radford Lamberton ..	Newport News S. Co.	1919	314.4	31	9.8	..	{1060 1090}	25,000	35	4 4-in. 1 3-in. A.A.	4 triple	122	286
Lea ..	Cramp, Pa.	1918	314.4	31	9.8	..	1,000	26,000	35	4 4-in., 1 3-in. A.A. (Rathburne has 3 4-in.)	4 triple	122	286
Dorsey ..													
Dent ..													
Waters ..													
Talbot ..													
Rathburne ..													
Crane ..	Union Plant.	1919	314.4	31	9.8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple	122	283
Williams ..		1919											
Chew ..													
Mugford ..	Fore River S.B. Co.	1918	314.4	31	9.8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple	122	286
Champlin ..													
Schley ..													
Bell ..	Mare Island, N.Y.	1918	314.4	31	9.8	..	1,090	27,000	35	4 4-in., 1 3-in. A.A.	4 triple	122	286
Taylor ..		1919											
Fairfax ..		1919											
Gridley ..	Union I.W.	1919	314.4	31	9.9	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple	122	286
Harding ..		1918											
McKean ..		1918											
Ringgold ..	Fore River S.B. Co.	1918	314.4	31	9.8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple	122	283
Robinson ..		1918											
McKee ..		1918											
Stevens ..	Bath I.W.	1917	314.4	31	9.7	..	1,090	24,200	35	{ 4 4-in., 1 3-in. A.A.	4 triple	122	286
Colhoun ..		1917											
Dyer ..		1917											
Stringham ..	Fore River S.B. Co.	1918	314.4	31	9.8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple	122	283
Gregory ..													
Sligourney ..													
Kimberly ..	Bath I.W.	1917	314.4	31	9.7	..	1,090	24,200	35	{ 4 4-in., 1 3-in. A.A.	4 triple	122	286
Little ..		1917											
Evans ..		1917											
Phillip ..	Bath I.W.	1917	315.5	30.7	9.5	..	20,000	32	{ 3 4-in., 1 3-in. A.A.	4 triple	122	260	
Wickes ..		1917											
Manley ..		1917											
Stockton ..	Cramp Pa.	1917	315.5	30.7	9.5	..	18,500	30	{ 5 4-in., 1 3-in. A.A.	4 triple	122	260	
Conner ..		1918											
Gwin ..		1920											
Craven ..	Seattle D.D. Co.	1920	315.5	30.7	9.5	..	1020	18,750	30	{ 4 4-in., 1 3-in. A.A.	4 triple	122	260
	Norfolk, N.Y.	1918	315.5	30.7	9.5	..		20,000	32	{ 4 4-in., 1 3-in. A.A.	4 triple	122	260
Caldwell ..	Mare Island N.W.	1917	315.5	30.7	9.5	..		21,000	30	{ 4 4-in., 1 3-in. A.A.	4 triple	122	260
Allen ..	Bath I.W.	1917	315.3	29.9	9.8	..	920	17,000	30	{ 4 4-in., 1 3-in. A.A.	4 triple	122	290
Rowan ..	Fore River S.B. Co.	1916	315.3	29.9	10.7	..	920	17,000	29.5	{ 4 4-in., 1 3-in. A.A.	4 triple	122	290
Sampson ..	Bath I.W.	1915	315.3	29.9	10	..	910	17,500	30	{ 4 4-in., 1 3-in. A.A.	4 triple	118	310
Wadsworth ..	Fore River S.B. Co.	1915	305.3	30.4	10.5	..	820	17,000	29	{ 4 4-in., 1 3-in. A.A.	4 triple	106	308
Cushing ..		1915	305.3	30.3	10.5	..	800	17,000	29		4 dbl.	106	307
Winslow ..		1914	305.3	30.5	10.5	..	820	16,000	29.5	{ 4 4-in., 1 3-in. A.A.	4 triple	106	310
Nicholson ..		1913	305.3	30.4	10	..	820	16,000	29	{ 4 4-in., 1 3-in. A.A.	4 triple	106	308
O'Brien ..		1914	305.3	30.4	10	..	820	16,000	29	{ 4 4-in., 1 3-in. A.A.	4 triple	106	308
Balch ..		1914	305.3	30.4	10	..	820	16,000	29	{ 4 4-in., 1 3-in. A.A.	4 triple	106	308
Benham ..		1913	305.3	30.4	10	..	820	16,000	29	{ 4 4-in., 1 3-in. A.A.	4 triple	106	308
Parker ..		1914	305.3	30.4	10	..	820	16,000	29	{ 4 4-in., 1 3-in. A.A.	4 triple	106	308
Aylwin ..		1913	305.3	30.4	10	..	820	16,000	29	{ 4 4-in., 1 3-in. A.A.	4 triple	106	308
Duncan ..		1913	305.3	30.4	10	..	820	16,000	29	{ 4 4-in., 1 3-in. A.A.	4 triple	106	308
Downes ..	Fore River S.B. Co.	1915	305.3	30.4	9.8	..	820	16,000	29	4 4-in.	4 dbl.	104	306
Cummings ..	N.Y.S.B. Co.	1913	305.3	30.4	9.8	..	820	16,000	29	4 4-in.	4 dbl.	104	306
Cassin ..	Bath I.W.	1913	305.3	30.4	9.8	..	820	16,000	29	4 4-in.	4 dbl.	104	306
McDougal ..	Bath I.W.	1914	305.3	30.6	9.8	..	860	16,000	29.5				
Ericsson ..	N.Y.S.B. Co.	1915	305.3	30.6	10.7	..	800	16,000	29				
Tucker ..	Fore R.S.B. Co.	1918	305.3	29.9	10.3	..	910	18,000	29.5	4 4-in.	4 dbl.	104	{ 311 305 309 308 308 308 290 290 290
Conyngham ..	Cramp.	1918	315.3	29.9	10.1	..	910	17,500	29.5				
Porter ..	Cramp.	1918	315.3	29.9	10.1	..	910	18,000	29.5				
Wainwright ..	N.Y.S.B. Co.	1918	315.3	29.9	10.7	..	910	17,500	29.5				
Davis ..	Bath, I.W.	1916	315.3	29.9	9.8	..	920	17,500	30	{ 4 4-in., 2 3-in. A.A.	4 triple	120	290
Wilkes ..	Cramp.	1917	315.3	29.9	10.7	..	920	17,000	29.5				
Shaw ..	Mare I., N.Y.	1916	315.3	29.9	10.7	..	910	17,000	29.5				

In addition to the above there are 21 obsolete destroyers of the Flusser Class, completed 1910-1912. Their displacement is 650 tons, 20.5 knots, 10,520-12,000 H.P., 3 to 5 3-in. A.A. guns, and 3 double torpedo tubes. Their names are Mayrant, Henley, Jarvis, Beale, Fanning, Jenkins, Jouett, Patterson, Walke, Monaghan, Ammen, Trippe, Warrington, Burrows, McCall, Sterrett, Perkins, Drayton, Terry, Paulding, Roe. 8 of these are on the disposal list.

• Operated by the U.S. Coast Guard.

## United States—continued.

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.											
			Length. (extreme).	Beam.	Draught.								Oil.											
			Feet.	Feet.	Feet			Tons.	Knots.				Tons.											
DESTROYERS NOT FITTED AS MINELAYERS—																								
Sproston ..	Union I.W.	1919	314.4	30.5	9	2	1,160	27,000	35	4 4-in. 1 3-in. A.A. 92 mines	..	107	283											
Anthony ..		1919																						
Ingraham ..		1919																						
Lansdale ..	Fore River S.B. Co.	1918																						
Luce ..																								
Israel ..																								
Murray ..	Newport News S. Co.	1919	..	..	..	1,160	25,000	35	4 4-in. 1 14-pr. A.A. 92 mines	..	..	..												
Stribling ..																								
Lamsay ..																								
Gamble ..																								
Breese ..																								
Montgomery ..																								

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement. Surface.	Submerged.	Horse-Power.	Maximum Speed. Surface.	Submerged.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.										
			Feet.	Feet.	Feet.		Tons.			Knots					Tons.
<b>SUBMARINES—</b>															
V7 Dolphin	Portsmouth Navy Yard.	Bldg.	319	27.7	13	..	1,540 2,215	4,250 —	17 8	14-in.	6	..	..		
V8 Cachalot	Electric Boat Co.	Bldg.	275	24.8	13	..	1,130 1,650	..	..	13-in. A.A.	6	..	..		
V9 Cuttlefish							2,710 4,080	3,175 —	15 8	2 6-in., 60 mines	4	86	..		
V4 Argonaut	Portsmouth Navy Yard.	1928	381	33.7	15.4	..	2,710 3,960	3,175 —	15 —	2 6-in., 60 mines	4	86	..		
V5 Narwhal	Portsmouth Navy Yard.	1930	371	33.3	16	..	2,730 3,960	5,450 —	17 —	2 6-in.	6	88	..		
V6 Nautilus	Mare Island Navy Yard.						2,000 2,500	6,700 —	21 9	1 5-in. (Bass has 1 3-in. A.A.)	6	87	..		
V3 Bonita ..	Portsmouth Navy Yard.	1926	341.5	27.5	15.5	..	2,000 2,500	6,700 —	21 9	1 5-in. (Bass has 1 3-in. A.A.)	6	87	..		
V2 Bass ..		1925					1,000 1,458	2,800 1,500	14.8 11.0	1 4-in.	5	..	237		
V1 Barracuda		1924					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S48 ..	Lake T.B. Co., Bridgeport	1922	265.3	21.8	13.5	..	800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S47* ..	Bethlehem Shipbuilding Corp., Quincy Plant	1925	225.3	20.5	16	..	800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S46* ..		1925					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S45* ..		1925					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S44* ..		1925					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S43* ..		1924					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S42* ..	Bethlehem Shipbuilding Corp., Union Plant	1924	219.3	20.5	16	2	800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S41* ..		1924					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S40* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S39* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S38* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S37* ..	Bethlehem Shipbuilding Corp., Union Plant	1923	219.3	20.5	16	2	800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S36* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S35* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S34* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S33* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S32* ..	Bethlehem Shipbuilding Corp., Quincy Plant	1923	219.3	20.5	16	2	800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S31* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S30* ..		1920					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S29* ..		1924					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S28* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S27* ..	Bethlehem Shipbuilding Corp., Quincy Plant	1924	219.3	20.5	16	2	800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S26* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S25* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S24* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S23* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S22* ..	Bethlehem Shipbuilding Corp., Quincy Plant	1924	219.3	20.5	16	2	800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S21* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S20* ..		1922					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S19* ..		1921					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		
S18* ..		1923					800 1,062	1,200 1,500	14.5 11	1 4-in.	4	..	140		

\* Designed by Electric Boat Co., Groton, Conn.

## United States—continued.

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement. Surface.	Submerged.	Horse-Power.	Maximum Speed. Surface. Submerged.	Armament.	Torpedo Tubes.	Complement.	Fuel Capacity.		
			Length. (Extreme.)	Beam.	Draught.											
			Feet.	Feet.	Feet.		Tons.		Knots					Tons.		
SUBMARINES— <i>continued.</i>																
S17 .. ..	Lake T.B. Co., Bridgeport	1921	231	21.5	13	..	790 1,092	2,000 1,200	15.25 9	1 4-in.	4	38	123			
S16 .. ..		1920														
S15 .. ..		1921														
S14 .. ..		1921														
S13 .. ..		1923														
S12 .. ..	Navy Yard, Ports- mouth	1923	231	21.8	13	..	790 1,092	2,000 1,200	15.8 9	1 4-in.	5	38	123			
S11 .. ..		1923														
S10 .. ..		1922														
S9 .. ..		1921														
S8 .. ..		1920														
S7 .. ..		1920														
S6 .. ..		1920														
S4† .. ..		1919														
S3 .. ..	1919															
S1* .. ..	Fore River S.B. Co.	1920	219.3	20.7	16	..	800 1,062	1,500 1,500	14.5 11	1 4-in., 1 aeroplane	4	38	140			
R20* .. ..	Union, I.W.	1918	186.1	17.5	14.5	2	530 680	880 934	13.5 10.5	1 3-in.	4	30	63			
R19* .. ..		1918														
R18* .. ..		1918														
R17* .. ..		1918														
R16* .. ..		1918														
R15* .. ..		1918														
R14* .. ..		1919														
R13* .. ..		1919														
R12* .. ..		1919														
R11* .. ..		1919														
R10* .. ..	1919															
R9* .. ..	Fore River S.B. Co.	1919	172.3	17.5	14.4	2	480 624	880 740	14 10.5	1 3-in.	4	30	73			
R8* .. ..																
R7* .. ..																
R6* .. ..																
R5* .. ..																
R4* .. ..																
R3* .. ..																
R2* .. ..																
R1* .. ..	Fore River S.B. Co.	1918				2	480 624	880 740	14 10.5	1 3-in.	4	30	73			
O10* .. ..																
O9* .. ..																
O8* .. ..																
O7* .. ..																
O6* .. ..																
O4* .. ..																
O3*§ .. ..																
O2*§ .. ..																
O1*§ .. ..																

\* Designed by Electric Boat Co., Groton, Conn.

† Used for salvage operations.

§ To be disposed of shortly.

A submarine named Neff (No. 108) is projected—no funds are voted for construction.

The machinery contractors for the vessels of the E. B. Co. Design built in yards other than the Navy Yards were the New London Ship and Eng. Co., Groton, Conn., and the hulls were built under sub-contract from the E. B. Co.





**TABLES OF COMPARATIVE  
NAVAL STRENGTH**



TABLE I.—EFFECTIVE FIGHTING SHIPS, BUILT, BUILDING, AND AUTHORISED.

Class.	British Empire.			U.S.A.			Japan.			France.			Italy.			Soviet Union. ( <i>or</i> )			Germany.		
	Built.	Building.	Authorised.	Built.	Building.	Authorised.	Built.	Building.	Authorised.	Built.	Building.	Authorised.	Built.	Building.	Authorised.	Built.	Building.	Authorised.	Built.	Building.	Authorised.
Battleships, 14-in. guns and upwards . . . . .	12	—	—	14	—	—	9	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Battleships, smaller guns . . . . .	—	—	—	1	—	—	—	—	—	—	9	1	4	—	—	5	—	—	4	3	1 ( <i>a</i> )
Battle-cruisers . . . . .	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aircraft and seaplane carriers . . . . .	8 ( <i>b</i> )	—	—	3	1	—	4 ( <i>c</i> )	1	—	—	2 ( <i>d</i> )	—	1 ( <i>e</i> )	—	—	—	—	—	—	—	—
( <i>f</i> ) Cruisers, guns above 6·1-in. . . . .	19	—	—	10	5	3 ( <i>g</i> )	12 ( <i>h</i> )	—	—	1	11 ( <i>i</i> )	—	10 ( <i>k</i> )	1	—	—	—	—	—	—	—
( <i>f</i> ) Cruisers, guns 6·1-in. and below . . . . .	32	7	3 ( <i>l</i> )	11 ( <i>m</i> )	—	—	19	2	—	2	9 ( <i>n</i> )	4 ( <i>z</i> )	13	4	—	8	2	—	6	—	—
Flotilla Leaders and Destroyers . . . . .	154	13	9 ( <i>h</i> )	223 ( <i>o</i> )	5	6	102	3 ( <i>p</i> )	3 ( <i>q</i> )	80 ( <i>r</i> )	12	2	31 ( <i>s</i> )	6	—	255 ( <i>y</i> )	3	16 ( <i>t</i> )	—	—	( <i>u</i> )
Submarines . . . . .	54	7	3 ( <i>l</i> )	81	3	—	62	2	2 ( <i>v</i> )	82	26	—	42	29	—	22	25	21	—	—	—

## NOTES.—

(a) Projected, but no money yet voted.

(b) Includes "Albatross," seaplane carrier, and "Ark Royal," aircraft tender. The latter is used for experimental work.

(c) Includes "Notoro," seaplane carrier.

(d) Includes "Commandant Teste," aviation transport, a special type under the terms of the London Naval Treaty.

(e) "Miraglia," seaplane carrier.

(f) Cruiser minelayers are not included in these totals.

(g) Authorised, and may be laid down in 1933, 1934 and 1935. In addition 5 are projected, but may not be built until the expiry of the London Naval Treaty.

(h) In addition there are 7 old cruisers classed as coast defence vessels, 1st class.

(i) Includes the old cruisers "Condé" and "Jeanne d'Arc II."

(j) Includes the old cruiser "F. Ferruccio."

(k) 1932 programme.

(m) Includes the old cruiser "Rochester," listed for disposal.

(n) Includes the old cruiser "Gueydon."

(o) Includes destroyers equipped as targets, etc. In addition to this total there are 12 destroyers fitted as minelayers, and 16 operated by the U.S. Coast Guard.

(p) 2 torpedo boats also building.

(q) 9 destroyers are projected.

(r) There are 4 first class torpedo boats in addition.

(s) There are 10 torpedo boats in addition.

(t) There are 4 destroyers are projected.

(u) 7 submarines are projected.

(v) Includes vessels under French protection at Bizerta.

(w) Exact number uncertain—many of these are at present of no fighting value.

(z) Details of armament not yet published.

TABLE II.—BATTLESHIPS WITH 14-IN. GUNS AND UPWARDS.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.			
1925	Nelson	33,500 tons.	1921	Colorado	32,500 tons.	1920	Mutsu	32,720 tons.												
1925	Rodney	33,900	1921	West Virginia	31,800	1919	Nagato	32,720												
1915	Malaya	31,100	1920	Maryland	31,500	1917	Hyuga	29,990												
1914	Vallant	31,100	1919	Tennessee	32,300	1916	Ise	29,330												
1914	Barham	31,100	1919	California	32,600	1915	Yamashiro	29,330												
1913	Queen Elizabeth	31,100	1917	Idaho	30,800	1914	Fuso	29,330												
1913	Warspite	31,100	1917	New Mexico	30,000	1913	Kirishima	29,330												
1915	Royal Sovereign		1917	Mississippi	30,100	1913	Haruna	29,330												
1914	Royal Oak		1915	Arizona	32,100	1912	Kongo													
1915	Revenge	29,150	1915	Pennsylvania	29,000															
1916	Resolution		1914	Oklahoma	29,000															
1916	Ramillies		1912	Texas	27,000															
			1912	New York	27,000															
12 ships.		368,650	14 ships.		427,800	9 ships.		272,070												

TABLE III.—BATTLE-CRUISERS WITH 14-IN. GUNS AND UPWARDS.

BRITISH EMPIRE.			UNITED STATES.		* JAPAN.		FRANCE.		ITALY.		SOVIET UNION.		GERMANY.	
Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.
1918	Hood...	tons.												
1916	Renown	42,100												
1916	Repulse	32,000												
3 ships.		106,100												

\* Hiyel (Japan) is retained as a training ship in accordance with London Naval Treaty.

TABLE IV.—BATTLESHIPS WITH GUNS BELOW 14-IN.

[illegible]

\* See note (\*) below.

TABLE V.—BATTLE-CRUISERS WITH GUNS BELOW 14-IN.

[illegible]

\* Emperor of India and Marlborough (Great Britain) and Florida and Utah (United States) were disposed of in 1931 in accordance with the London Naval Treaty, and Iron Duke (Great Britain) and Wyoming (United States) were retained as training ships.

† Tiger was disposed of in 1931 in accordance with the London Naval Treaty.



TABLE VI.—CRUISERS  
Cruisers marked \* have guns above 6-1-in.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.
32½	London	9,750	33	Omaha	10,000	33-2	Tourville *	10,000	35	Trento *	10,000	35	Trento *	10,000	29½	Profintern *	7,600	32	Emden	6,000
32½	Devonshire	9,750	33	Milwaukee	10,000	33	Myoko *	10,000	35	Trieste *	10,000	35	Trieste *	10,000	29½	Chevronay *	7,600	32	Königsberg	6,000
32½	Shropshire	9,750	33	Chidmatti	10,000	33	Adigara *	10,000	35	Taranto *	10,000	35	Taranto *	10,000	29½	Chervonaya *	7,600	32	Kanaruk	6,000
32½	Suez	9,750	33	Raleigh	10,000	33	Haguro *	10,000	35	Quaro *	10,000	35	Quaro *	10,000	29½	General *	7,600	32	Köln	6,000
31½	Berwick	9,750	33	Detroit	7,050	33	Kako *	7,100	34	Duguay-Trouin *	7,249	34	Ancona *	7,249	23	Kornilov †	6,875	32	Lepzig	6,000
31½	Cornwall	9,750	33	Richmond	7,050	33	Furutaka *	7,100	34	La Motte-Picquet *	7,249	34	Bratt *	7,249	23	Komintern	6,875	32	Berlin	3,983
31½	Kent	9,500	33	Concord	7,050	33	Kingasa *	7,100	34	Primauguet *	5,265	34	Brindisi	7,156	20	Almas †	3,900	32		
31½	Suffolk	9,500	33	Trenton	7,050	33	Aoba *	7,100	34	Metz *	5,265	34	Venezia	7,156	20	Aurora	6,750	32		
31½	Cumberland	9,750	33	Memphis	8,150	33	Sakata *	8,150	34	Gen. Konigsberg *	4,521	34	Lofa *	8,232	29½	Krasni	7,600	32		
31½	Australia (A)	9,870	33	Recheater †	8,150	33	Savai *	8,150	34	Strasbourg	4,723	34	San Giorgio	8,350	25	Voroshilov	7,600	32		
31½	Canberra (A)	9,850	33	Salt Lake	8,150	33	Junzu *	8,150	34	(ex-Strasbourg)	4,723	34	San Marco *	8,350	25		7,600	32		
31½	Enterprise	7,850	32½	City	8,170	33	Nakava *	8,170	34	Thionville	3,922	34	Pisa *	8,758	25	Admiral Isidoro Kornilov	7,600	32		
30½	Edinburgh	9,170	32½	Pensacola *	9,100	33	Abukuma *	9,170	34	(ex-Teknabour)	3,922	34	Alberico di	4,896	—		7,600	32		
30½	Fraser	9,850	32½	Northampton	9,050	33	Natori	9,170	34	(ex-Novara)	3,922	34	Barbano	4,896	—		7,600	32		
29	Hawkins	9,800	32	ton *	9,050	33	Yura *	9,170	34	Waldeck Rouss *	12,617	34	Colleoni	11,072	—		7,600	32		
29	Dispatch (N.Z.)	4,850	32	Chester *	9,200	33	Kuma *	9,170	34	Ernest Renan *	12,617	34	Giov. della	11,072	—		7,600	32		
29	Orban	9,200	32	Louisville *	9,200	33	Tama *	9,170	34	Jules Michelet *	11,072	34	Bande Nere	10,000	—		7,600	32		
29	Delphin	9,200	32	Chicago	9,300	33	Kikami *	9,170	34	Colbert *	10,000	34	Flume *	10,000	—		7,600	32		
29	Pinedin (N.Z.)	4,850	32	Houston	9,600	33	Kiso *	9,170	34	Foch *	10,000	34	Gozila *	10,000	—		7,600	32		
29	Panama	9,600	32	Portland	9,600	33	O-1 *	9,170	34	Jeune d'Arc *	10,000	34	Armando Diaz	5,089	—		7,600	32		
29	Panthers	9,600	32	Portland	9,600	33	Yubari *	9,170	34	Dupleix *	10,000	34	Luigi Cadorna	5,089	—		7,600	32		
29	Dragon	10,000	32	Indiana *	10,000	33	Tenryu	3,230	34	Algeria *	10,000	34	Pola *	10,000	—		7,600	32		
29	Capetown	4,200	32	poli *	4,400	33	Tasuta	3,230	34	La Galissonnière	7,600	34	Bolzano *	10,000	—		7,600	32		
29	Calcutta	4,200	32	New Orleans	10,000	33	Hirado	4,400	34	Jean de Venne	7,600	34	Montevideo	5,500	—		7,600	32		
29	Carille	4,200	32	Atoria *	10,000	33	Takao *	10,000	34	Attilio	7,600	34	Attendulo	5,500	—		7,600	32		
29	Colombo	4,200	32	Amnopolis *	10,000	33	Atago *	10,000	34	Emmanuel	7,600	34	Nicola	5,500	—		7,600	32		
29	Cardiff	4,200	32	Tuscanos *	10,000	33	Chokai *	10,000	34	Emmanuel	7,600	34	Emmanuel	5,500	—		7,600	32		
29	Corentry	4,200	32	Son	10,000	33	Maya *	10,000	34	Emmanuel	7,600	34	Emmanuel	5,500	—		7,600	32		
29	Curlew	4,200	32	Francisco	10,000	33	No. 1	8,500	34	Emmanuel	7,600	34	Emmanuel	5,500	—		7,600	32		
29	Ceres	4,200	32	Three in no.	10,000	33	No. 2	8,500	34	Emmanuel	7,600	34	Emmanuel	5,500	—		7,600	32		
29	Carsaco	4,200	32	unauthorised	10,000	33	No. 2	8,500	34	Emmanuel	7,600	34	Emmanuel	5,500	—		7,600	32		
29	Caledon	4,180	32	(may be laid down 1933-5).	10,000	33	No. 2	8,500	34	Emmanuel	7,600	34	Emmanuel	5,500	—		7,600	32		
29	Calypso	4,180	32		10,000	33	No. 2	8,500	34	Emmanuel	7,600	34	Emmanuel	5,500	—		7,600	32		
29	Caradoc	4,180	32		10,000	33	No. 2	8,500	34	Emmanuel	7,600	34	Emmanuel	5,500	—		7,600	32		

(A) Australian Navy.

(N.Z.) New Zealand Navy.

† Under French protection a Bizerta.

‡ Listed for disposal.

TABLE VI.—CRUISERS (continued).

[illegible]

† One cruiser minelayer (*Adventure*, 6740 tons) in addition.

**(A) Australian Navy.**

A number of old cruisers are not included in the above lists, viz. Japan, 8 (classified as coast defence vessels); France, 3 (Condé, Gueyllon and Jeanne d'Arc II.); Italy, 1 (F. Ferruccio).



TABLE VII.—AIRCRAFT AND SEAPLANE CARRIERS.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.
1916	Furious	22,450 tons	1912	Langley**	11,500 tons	1920	Notoro†	14,050 tons	1920	Béarn†	22,146 tons	1923	Miraglia††	4,882 tons						
1917	Argus	14,450	1925	Lexington*	33,000	1921	Hosho	7,470	1929	Commandant Teste††	10,000									
1917	Ark Royal	6,900	1925	Saratoga*	33,000	1925	Akagi*	26,900												
1914	Hermes	10,850	1925	Ranger	13,800	1921	Kaga†	26,900												
1919	Eagle†	22,600				1931	Ryūjō	7,600												
1918	Courageous	22,500																		
1928	Albatross	4,800																		
1916	Glorious*	22,500																		
	8 ships.	127,050		4 ships.	91,300		5 ships.	82,920		2 ships.	32,146		1 ship.	4,882		Nil	—		Nil	—

\* Designed as battle-cruisers; converted to aircraft-carriers under the Washington Treaty.

† Designed as battleships.

\*\* Converted from collier Jupiter in 1921.

†† Aviation transport, a special type under the terms of London Naval Treaty.

NOTE.—Vessels of which the names are printed in italics are under construction.

† Seaplane carrier converted from an oiler.

(A) Seaplane carrier, Australian Navy.

†† Seaplane carrier.

BRITISH AND FOREIGN  
ORDNANCE TABLES



# VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS.

Tables Corrected by the Manufacturers, November, 1932.

## NAVAL GUNS AND MOUNTINGS.

	37 mm. 1-pdr. Auto.	37 mm. 1½-pdr. Auto.	40 mm. 2-pdr. Auto.	40 mm. 2½-pdr. Auto.	47 mm. 3-pdr. Semi- Auto.	57 mm. 6-pdr. Semi- Auto.	4-in. 101·6 mm. Semi- Auto.	4-in. 101·6 mm. Semi- Auto.	4·7-in. 120 mm. Semi- Auto.	4·7-in. 120 mm. Semi- Auto.	5·118-in. 130 mm. Semi- Auto.	5·5-in. 139·7 mm. Semi- Auto.
Diameter of Bore . . .	ins. 1·457	ins. 1·457	ins. 1·575	ins. 1·575	ins. 1·85	ins. 2·244	ins. 4	ins. 4	ins. 4·724	ins. 4·724	ins. 5·118	ins. 5·5
Length of Bore . . .	mm. 37	mm. 37	mm. 40	mm. 40	mm. 47	mm. 57	mm. 101·6	mm. 101·6	mm. 120	mm. 120	mm. 130	mm. 139·7
Weight of Gun . . .	lbs. 30	lbs. 30	lbs. 39·37	lbs. 39·37	lbs. 50	lbs. 50	lbs. 36·0	lbs. 36·0	lbs. 50	lbs. 50	lbs. 52	lbs. 50
Weight of Projectile . . .	kg. 1·36	kg. 1·36	kg. 1·575	kg. 1·575	kg. 2·244	kg. 2·244	kg. 1·830	kg. 1·830	kg. 3·391	kg. 3·391	kg. 4·470	kg. 4·470
Muzzle Velocity . . .	f.s. 1,800	f.s. 1,800	f.s. 2,000	f.s. 2,000	f.s. 2,800	f.s. 2,800	f.s. 3,000	f.s. 3,000	f.s. 3,000	f.s. 3,000	f.s. 3,000	f.s. 3,000
Muzzle Energy . . .	f.t. 549	f.t. 549	f.t. 600	f.t. 600	f.t. 853	f.t. 853	f.t. 823	f.t. 823	f.t. 915	f.t. 915	f.t. 900	f.t. 914
Penetration . . .	ins. 7	ins. 7	ins. 32	ins. 32	ins. 55·75	ins. 86·7	ins. 13·6	ins. 13·6	ins. 16	ins. 16	ins. 20	ins. 22
Rounds per Minute . . .	mm. 250	mm. 250	mm. 200	mm. 200	mm. 170	mm. 190	mm. 345	mm. 345	mm. 420	mm. 420	mm. 510	mm. 560
Weight of Mounting and Shield . . .	kg. 1,676	kg. 1,676	kg. 1,009	kg. 1,009	kg. 586	kg. 906	kg. 3,315	kg. 3,315	kg. 7,607	kg. 7,607	kg. 8,179	kg. 9,246
Weight of Shield . . .	kg. 11	kg. 11	kg. 11	kg. 11	kg. 11	kg. 11	kg. 11	kg. 11	kg. 11	kg. 11	kg. 11	kg. 11
Thickness of Shield . . .	ins. 22	ins. 22	ins. 22	ins. 22	ins. 22	ins. 22	ins. 22	ins. 22	ins. 22	ins. 22	ins. 22	ins. 22
Angle of Elevation . . .	deg. 85	deg. 85	deg. 85	deg. 85	deg. 85	deg. 85	deg. 85	deg. 85	deg. 85	deg. 85	deg. 85	deg. 85
Angle of Depression . . .	deg. 5	deg. 5	deg. 5	deg. 5	deg. 5	deg. 5	deg. 5	deg. 5	deg. 5	deg. 5	deg. 5	deg. 5

The above guns are of all-steel construction. Guns of steel and wire construction are manufactured having approximately the same characteristics.





	2-953-in. 75 mm. Field.	2-953-in. 75 mm. Field.	4-134-in. 105 mm. Howr.	4-134-in. 105 mm. Field.	4-134-in. 105 mm. Field.	5-in. 127 mm. Field.	5-9-in. 150 mm. Howr.	6-in. 152 mm. Field.	8-in. 203 mm. Railway.	8-268-in. 210 mm. Semi- Mobile.	12-in. 305 mm. Railway.	15-in. 381 mm. Railway.
Diameter of Bore	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.
Length of Bore	30	30	30	30	30	30	30	30	30	30	30	30
Weight of Gun	394	597	584	610	610	3,646	1,575	5,700	15,500	10,19	44,200	88,400
Weight of Projectile	14-33	15-43	26-45	35-27	35-27	56	90-4	100	256	11,125	850	885
Muzzle Velocity	6-5	7-0	12-0	15-0	15-0	25-5	45-4	45-4	116	130	2,933	2,500
Muzzle Energy	395	720	490	610	610	823	580	876	884	795	894	760
Rounds per Minute	117	185	147	284	284	877	703	1,774	14,930	13,515	50,705	84,560
Weight of Mounting and Shield	1,125	1,091	985	1,498	1,498	3,694	3,694	7,820	63,400	28,450	177,800	279,400
Thickness of Shield	80-7	80-7	80-7	80-7	80-7	80-7	80-7	80-7	80-7	80-7	80-7	80-7
Angle of Elevation	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.
Angle of Depression	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.

	57-mm. 6-pdr. Semi-Auto.	47-mm. 3-pdr. Semi-Auto.	40-mm. 2-pdr. Semi-Auto.	2-953-in. (75 mm.) Jointed.	4-134-in. (105 mm.) Jointed.	3-in. (76-2 mm.)
Diameter of Bore	ins.	ins.	ins.	ins.	ins.	ins.
Length of Bore	2-244	1-85	1-575	2-953	4-134	76-2
Weight of Gun	133	3-3	3-3	177	254	3
Weight of Projectile	6	1-5	0-907	14-33	26-45	12-5
Muzzle Velocity	1,200	1,854	2,000	1,450	1,148	5-67
Muzzle Energy	366	565	610	442	350	1,640
Rounds per Minute	18-6	24-5	17-2	65-0	74-5	233
Weight of Mounting and Shield	2	2	2	10	11	25
Thickness of Shield	14-9	12-7	117-5	533	581	10
Angle of Elevation	deg.	deg.	deg.	deg.	deg.	deg.
Angle of Depression	deg.	deg.	deg.	deg.	deg.	deg.

## VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS.—GUNS MOUNTED ON AIRCRAFT.

	*-303 in. (7.7 mm.) Vickers Berthier.	*-303 in. (7.7 mm.) Auto. Observer's gun.	*-303 in. (7.7 mm.) Auto. Pilot's gun.	*-5 in. (12.7 mm.) Auto. Pilot's gun.	1-0 in. (25.4 mm.) Auto.	1-457 in. (37 mm.) Auto.	1-575 in. (40 mm.) Semi-Auto.
Diameter of Bore . . . ins.	-303	-303	-303	-5	1-0	1-457	1-575
do. . . mm.	7.7	7.7	7.7	12.7	25.4	37	40
Length of Bore . . . cal.	72	79.2	93.7	60	30	22	40
Weight of Gun . . . lb.	18-25	22	30	52	110	150	234
do. . . kg.	8-27	10	13.6	23.6	50	68	106
Weight of projectile . . . lb.	174 grs.	174 grs.	174 grs.	565 grs.	3087 grs.	7,000 grs.	2
do. . . kg.	11.3 grms.	11.3 grms.	11.3 grms.	36.75 grms.	200 grms.	453.6 grms.	0.91
Muzzle Velocity . . . f.s.	2,400	2,400	2,440	2,550	1,542	1,200	2,300
do. . . m.s.	732	732	744	777	470	365.7	700
Muzzle Energy . . . f.t.	0.9	0.9	1	3.78	7.25	10	73
do. . . m.t.	0.28	0.28	0.31	1.17	2.24	3.09	22.6
Rounds per Minute . . . lb.	750-800	500-600	500-600	400-600	160	150	..
Weight of Mounting . . . lb.	5	..	..	..	60	..	..
do. . . kg.	..	..	..	..	27.2	..	432
Angle of Elevation . . . deg.	90	..	..	..	40	..	196
Angle of Depression . . . deg.	90	..	..	..	90	..	60
							30

\* This machine can be adapted to fire any pattern of rifle calibre ammunition.

## MACHINE GUNS—ANTI-AIRCRAFT.

	Vickers -303 in. (7.7 mm.) Auto.	Vickers Berthier -303 in. (7.7 mm.) Auto.	Vickers (12.7 mm.) Auto.	Vickers -5 in. H.V. (12.7 mm.)	Vickers 1-0 in. (25.4 mm.) Auto.	Vickers 1-457 in. (37 mm.) Auto.	Vickers 40-mm. 2-pdr. Auto.
Diameter of Bore . . . ins.	-303	-303	-303	-5	1-0	1-457	1-575
do. . . mm.	7.7	7.7	7.7	12.7	25.4	37	40
Length of Bore . . . cal.	93.7	72	60	90	40	42	50
Weight of Gun . . . lb.	32	20.8	52	80	187	490	590
do. . . kg.	14.5	9.4	23.6	36.5	85.7	222	268
Weight of Projectile . . . lb.	..	174 grs.	..	..	3,757 grs.	1.5 lbs.	2.2
do. . . kg.	..	11.3 grms.	..	..	243.5 grms.	681 kgs.	1.0
Muzzle Velocity . . . f.s.	2,440	2,400	2,550	3,000	2,000	2,100	2,625
do. . . m.s.	744	732	777	914	609	640	800
Muzzle Energy . . . f.t.	1	0.9	3.78	5.92	15.5	46	105
do. . . m.t.	..	0.28	1.17	1.83	4.8	14.25	17
Rounds per minute . . . lbs.	500-600	450-500	400-600	300	250	200	100
Weight of Mounting . . . lbs.	38	29	182	111	379	..	1,676
do. . . kgs.	17.25	13.2	82.6	50.4	126.5	..	760
Angle of Elevation . . . deg.	80	80	90	90	80	..	90
Angle of Depression . . . deg.	20	5	5	5	10	..	5



VICKERS-ARMSTRONGS LIMITED—GUNS AND AMMUNITION. INFANTRY GUNS.

	44-60 mm.		47 mm.		65 mm.	
	44 mm. Barrel.	60 mm. Barrel.	Armour-Piercing Ammunition.	High-Explosive Ammunition.	High Explosive Ammunition.	70 mm. Barrel.
Diameter of Bore . . . ins.	1.73	2.36	1.85	1.85	2.559	2.756
do. . . mm.	44	60	47	47	65	70
Length of Bore . . . cal.	30	20	20	20	16	15
Weight of Gun . . . .	Barrel.	Breech Ring.	Barrel.	Breech Ring.	Breech Ring.	Gun and Mechanism.
do. . . . kg.	75 lb.	50 lb.	78 lb.	55 lb.	62 lb.	172 lb.
Weight of Projectile . . . lb.	34	26 lb.	35.4	25	38 lb.	56.5 lb.
do. . . . kg.	2.75	11.8	3.3	3.3	17	25.6
Muzzle Velocity . . . f.s.	1,706	2,322	1,600	755	820	0.55
do. . . . m.s.	520	223	488	230	250	0.25
Muzzle Energy . . . f.t.	55.5	20.4	58.6	13.0	41.0	2461
do. . . . m.t.	17.2	6.3	18	4	12.7	750
Weight of Mounting and Shield lb.	326	326	397	397	450	9.8
do. . . . kg.	148	148	180	180	450	558 with Platform and S.C. Tube
Weight of Shield . . . lb.	—	—	45	45	106	253
do. . . . kg.	..	..	20.4	20.4	48	"
Thickness of Shield . . . ins.	..	..	0.14	0.14	0.16	"
do. . . . mm.	..	..	3.5	3.5	4	"
Angle of Elevation . . . deg.	44 mm. Barrel.	60 mm. Barrel.	Low Position.	High Position.	Low Position.	High Position.
Angle of Depression . . . deg.	10	20 to 60	15	45	20	45
	5	0	10	2½	10	10
						15 Nominal
						10

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. MACHINE GUNS.

	*Vickers -303-in. (7.7-mm.) Auto. Observer's Gun for Air- craft.	*Vickers -303-in. (7.7-mm.) Auto. Land Service and Naval.	*Vickers Berthier -303-in. (7.7- mm.) Auto. for Infantry.	Vickers -5-in. (12.7-mm.) Auto. Land and Naval.	Vickers (12.7-mm.) Auto. Pilot's Gun for Air- craft.	Vickers 1.0-in. (25.4- mm.) Auto. for Land and Naval.	Vickers 1.0-in. (25.4- mm.) Auto. for Air- craft.	Vickers 1.457-in. (37-mm.) Auto. for Air- craft.	Vickers 1.457-in. (37-mm.) Auto. for Land and Naval.	Vickers 1.575-in. (40-mm.) Auto- Naval.	Vickers 1.575-in. (40-mm.) 2.2-pdr. Auto.
Diameter of Bore	.303	.303	.303	.5	.5	1.0	1.0	1.457	1.457	1.575	1.575
do. do.	7.7	7.7	7.7	12.7	12.7	25.4	25.4	37	37	40	40
Length of Bore	79.2	93.7	72	60	60	40	30	22	42	39.37	50
Weight of Gun	22	30	20.8	80	52	187	110	150	490	590	1,270
do. do.	10	13.6	9.4	36.5	23.6	85.7	50	68	222	263	577
Weight of Projectile	174	174	174	770	664	3,757	3,087	7,000	10,500	14,010	2.2 lb.
do. do.	11.3	11.3	11.3	50	43	243.5	200	453.6	680	908.0	1000
Muzzle Velocity	2,400	2,440	2,400	2,725	3,000	2,000	1,542	1,200	2,100	1,972	2625
do. do.	732	744	732	830	914	609	470	365.7	640	600	800
Muzzle energy	0.9	1	0.9	5.65	5.92	15.5	7.25	10	46	54	105
do. do.	0.28	0.31	0.28	1.75	1.83	4.8	2.24	3.09	14.25	17	32
Rounds per minute	500-600	500-1000	450-500	300-400	400-600	250	160	150	200	200	100
Weight of Mounting	..	..	29	109	..	379	60	..	..	1,476	2,224
do. do.	..	..	13.2	50	..	126.5	27.2	..	..	760	1,009
Angle of Elevation	..	..	7.5°	90°	..	80°	40°	..	..	85°	90°
Angle of Depression	..	..	..	5°	..	10°	90°	..	..	5°	5°

\* These machine guns can be adapted to fire any pattern of rifle calibre cartridge.

# ANTI-AIRCRAFT GUNS.

	.303-in. Auto.	.5-inch Auto.	1-0-inch Auto.	40-mm. 2-pr. Auto.	40-mm. 2-2-pdr. Auto.	40-mm. 2-2-pdr. Auto.	47-mm. 3-pdr. Semi- Auto.	Mobile 75 mm. 40 Calibre Semi- Auto.	Mobile 75 mm. 46 Calibre Semi- Auto.	3-inch Q.F.	3-inch Semi- Auto.	4-in. Semi- Auto.	4-in. Semi- Auto.	Mobile 105 mm. 45 Calibre Semi- Auto.	4-7-in. Semi- Auto.
Construction	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel
Diameter of bore	.303 ins.	.5 ins.	1-0 ins.	1-575 ins.	1-575 ins.	1-575 ins.	1-85 ins.	2-953 ins.	2-953 ins.	3 ins.	3 ins.	4 ins.	4 ins.	4-134 ins.	4-724 ins.
Length of bore	7-7 mms.	12-7 mms.	25-4 mms.	40 mms.	40 mms.	40 mms.	47 mms.	75 mms.	75 mms.	76-2 mms.	76-2 mms.	101-6 mms.	101-6 mms.	105 mms.	120 mms.
Weight of gun	32 lb. lbs.	80 lb. lbs.	187 lb. lbs.	590 lb. lbs.	1270 lb. lbs.	1270 lb. lbs.	305 lbs.	560 lbs.	46 lbs.	13 lbs.	13 lbs.	16 lbs.	16 lbs.	45 lbs.	40 lbs.
Weight of projectile	14-5 lbs.	36-3 lbs.	85-7 lbs.	268 lbs.	577 lbs.	577 lbs.	305 lbs.	560 lbs.	46 lbs.	13 lbs.	13 lbs.	16 lbs.	16 lbs.	45 lbs.	40 lbs.
Muzzle velocity	174 grs. grs.	770 grs. grs.	3757 grs. grs.	2 grs.	2-205 grs.	2-205 grs.	3-3 grs.	14-33 grs.	14-33 grs.	12-5 grs.	11-7 grs.	18-42 grs.	18-42 grs.	35-274 grs.	48-5 grs.
Muzzle energy	2,440 ft.-lbs.	830 ft.-lbs.	2,000 ft.-lbs.	1,971 ft.-lbs.	2,625 ft.-lbs.	2,625 ft.-lbs.	2,800 ft.-lbs.	2,461 ft.-lbs.	2,641 ft.-lbs.	2,600 ft.-lbs.	2,560 ft.-lbs.	2,700 ft.-lbs.	2,700 ft.-lbs.	2,625 ft.-lbs.	2,560 ft.-lbs.
Rounds per minute	31 mms.	175 mms.	4-8 mms.	200 mms.	32 mms.	32 mms.	30 mms.	215 mms.	215 mms.	107-8 mms.	108 mms.	18 mms.	18 mms.	672 mms.	780 mms.
Weight of mounting (exclusive of Gun)	38 lb.	109 lb.	379 lb.	14324	19312	19312	1823	213	223	19339	2182	614018	614018	5111	9010
Angle of elevation	17-2 deg.	50 deg.	126-5 deg.	760 deg.	1009 deg.	1009 deg.	941-1 deg.	2121 deg.	2172 deg.	2023-4 deg.	2425-8 deg.	6815 deg.	6815 deg.	5660 deg.	9157-1 deg.
Angle of depression	20 deg.	5 deg.	10 deg.	5 deg.	0 deg.	0 deg.	5 deg.	0 deg.	0 deg.	5 deg.	5 deg.	5 deg.	5 deg.	5 deg.	5 deg.



## BEARDMORE GUNS AND HOWITZERS.

## NAVAL.

	4	4	4.7	4.7	4.7	5.5	5.5	5.5	5.5	6.0	6.0	7.5	8	8	9.2	12	13.5	15	16
Calibre	ins.	mm.	120	120	120	140	140	140	140	152	152	190	203.2	203.2	234	305	343	381	406
Length of Bore	ins.	mm.	45	45	45	55	55	55	55	55	55	66	66	66	66	66	66	66	66
Weight of Gun	tons	lbs.	3.35	3.35	3.35	3.85	3.85	3.85	3.85	4.35	4.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35
do.	kg.	kg.	3,405	3,405	3,405	3,911	3,911	3,911	3,911	4,377	4,377	5,377	5,377	5,377	5,377	5,377	5,377	5,377	5,377
Weight of Projectile	lbs.	kg.	31	31	31	37	37	37	37	43	43	53	53	53	53	53	53	53	53
do.	kg.	kg.	22.68	22.68	22.68	26.8	26.8	26.8	26.8	30.9	30.9	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1
Muzzle Velocity	f.s.	m.s.	2,920	2,920	2,920	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
do.	f.s.	m.s.	914	914	914	914	914	914	914	914	914	914	914	914	914	914	914	914	914
Muzzle Energy	f.t.	m.t.	3,017	3,017	3,017	3,026	3,026	3,026	3,026	3,026	3,026	3,026	3,026	3,026	3,026	3,026	3,026	3,026	3,026
do.	f.t.	m.t.	837	837	837	937	937	937	937	937	937	937	937	937	937	937	937	937	937

## ANTI-AIRCRAFT.

	Motor Boats or Sub-marines.	Sub-marine.	For Sub-marines.	Fixed.	Fixed.	Fixed.	Mobile.	Tank Guns.
Calibre	3-0	4-0	3-0	4-0	4-0	4-7.24	3-0.2	1-8.5
do.	75	75	75	101-6	101-6	120	77	47
Length of Bore	45	40	45	50	50	40	47.5	30-0
Weight of Gun	0-67	1-3	1-65	1-95	2-1	3-1	0-75	1-8 cwt.
do.	kg.	kg.	1,675	1,981	2,133	3,150	762	284
Weight of Projectile	12-5	31	16	31	31	48-5	17-6	3-25
do.	lbs.	lbs.	16	31	31	48-5	17-6	6
Muzzle Velocity	5-67	14-06	7-26	14-06	14-06	22	8-0	3-25
do.	kg.	kg.	2,200	2,250	2,850	2,850	2,175	1-49
Muzzle Energy	670	685-8	640	792	869	780	663	1,750
do.	f.s.	f.s.	489	744	869	780	663	533
Muzzle Energy	419	1,088	744	1,453	1,740	2,205	577	69
do.	f.t.	f.t.	230	450	530	672	179	96-7
do.	m.t.	m.t.	131	230	230	230	238	30

Semi-Auto.

## FIELD GUNS AND HOWITZERS.

	Infantry Guns.	Gun.	How.	How.	How.	How.	How.	How.	How.	How.	How.	How.	How.	How.	How.	How.	How.	How.	How.
Calibre	1-85	1-575	2-24	3-3	4-134	3-3	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5
do.	47	40	57	84	105	84	112	112	112	112	112	112	112	112	112	112	112	112	112
Length of Bore	28-5	37	24	31	20	15	20	20	20	20	20	20	20	20	20	20	20	20	20
Weight of Gun	1-03	0-92	0-92	0-92	0-92	0-92	0-92	0-92	0-92	0-92	0-92	0-92	0-92	0-92	0-92	0-92	0-92	0-92	0-92
do.	kg.	kg.	46-7	46-7	46-7	46-7	46-7	46-7	46-7	46-7	46-7	46-7	46-7	46-7	46-7	46-7	46-7	46-7	46-7
Weight of Projectile	3-25	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0
do.	lbs.	lbs.	6-7	6-7	6-7	6-7	6-7	6-7	6-7	6-7	6-7	6-7	6-7	6-7	6-7	6-7	6-7	6-7	6-7
Muzzle Velocity	1,490	0-91	0-91	0-91	0-91	0-91	0-91	0-91	0-91	0-91	0-91	0-91	0-91	0-91	0-91	0-91	0-91	0-91	0-91
do.	f.s.	f.s.	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Muzzle Energy	473	609-6	213-4	555	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412
do.	m.s.	m.s.	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
Muzzle Energy	16-7	17	6-3	131	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138
do.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	S.A.

In same carriage.

In same carriage.

# FRENCH NAVAL ORDNANCE.

Date and Pattern of Gun.	Model 1893-96.	Model 1893-96.	Model 1902.	Model 1902-06.	Model 1906.	Model 1906-10.	Model 1910.	Model 1912.	Model 1919.	Model 1920.	Model 1923.	Model 1924.	Model 1924.	Model 1927.
Calibre . . . cms.	19.4	16.4	19.4	24	30.5	30.5	13.8	34	18	15.5	13.8	13	20.3	13.8
Calibre . . . ins.	7.64	6.46	7.64	9.45	12.01	12.01	5.43	13.4	5.12	6.1	5.43	5.12	7.99	5.43
Length . . . cals.	40	45	50	49.5	45	44.67	55	45	40	50	40	40	50	40
Total weight . . tons	12.48	8.1	14.94	28.8	53.23	53.16	5.22	65.23	4.32	8.73	4.05	3.81	20.39	4.81
Firing Charge, A.P. Projectile . . lbs.	74.3	43.45	84.66	147.05	237.7	277.8	23.68	334	17.05	43.21	17.86	17.05	103.12	17.86
A.P. Projectile lbs.	199.09	121.03	199.08	487.22	970.32	962.38	80.47	1222.44	70.44	124.07	87.98	70.44	271.61	87.98
Muzzle Velocity. f.-s.	2,756	2,838	3,117	2,625	2,559	2,569	2,723	2,605	2,408	2,789	2,297	2,408	2,789	2,297

## ITALIAN NAVAL ORDNANCE.

Official Designation :— Calibre min., length cal. Mark A. = Armstrong, V. = Vickers, An. = Ansaldo, S. = Schneider, Mark O.T.O. = Odero-Ter- Orlando Date of introduction.	305/46 A., V.	254/45 A.	254/45 V.	208/53 An.	203/50 S.-An.	190/45 A., V.	152/53 An. O.T.O.	152/50 A.	152/45 S.	120/50 An.	120/50 A., V.	120/45 A.	102/45 S. A.	100/47 O.T.O.	102/35 S.	76/50 A., V.	76/45 S.	76/40 A.	76/17 S.
Designation by calibre, cm.	30-479	25-4	25-4	20-3	20-3	19-05	15-24	15-24	15-24	12-0	12-0	12-0	10-2	10-0	10-2	7-62	7-62	7-62	7-62
Calibre in inches	12	10	10	8	8	7-5	6	6	6	4-75	4-75	4-75	4	3-9	4	3	3	3	3
Total, in feet	47-7	39-07	38-715	34-593	34-593	29-22	27-83	25-94	23-42	19-57	20-38	18-38	15-715	15-721	13-247	11-722	10-292	10-292	4-593
Rifled Bore, in inches	47-7	35-84	370-5	358-66	358-66	281-7	—	256-6	219-2	—	204-64	174-64	150-74	12-365	114-29	126	107-2	101-57	44-8
Powder Chamber in inches	97-7	74-91	74-91	64-56	64-56	51-65	—	44-6	44-6	—	28-64	35-03	27-16	3-112	23-50	22	25-4	—	—
Bore in calibres	37-3	35-84	37-05	—	—	37-5	—	42-77	36-54	—	43-31	36-96	37-53	15-371	28-46	42	35-73	28-42	14-96
No. of Grooves	72	60	70	52	52	44	44	36	56	36	36	36	40	26	32	28	25-8	16	24
Twist of Rifling, in calibres	30	30	00-30	—	—	00-30	30	33	36	30	30	30	30	30	—	30	35-9	33	22
Total Weight in tons	62-99	34-49	35-339	19-170	20-800	14-478	7-700	8-100	7-025	3-00	3-662	4-035	2-327	2-020	1-200	1-122	0-698	0-660	0-104
Firing Charge { Armour-piercing pro- jectile . . . lb. Common Shell, H.E., lb.	346	185	185	111-994	103-19	70-987	43	—	—	—	—	—	—	—	—	—	—	—	—
Weight { Armour-piercing projec- tile . . . lb. Shell, H.E., lb. Shrapnel, lb.	997-2 884-4	494 489-8	494 489-8	275-573	260	200-39 498-5	103-5	—	—	50-5	—	—	—	—	—	—	3-571	2-281	0-529
Substituting { Armour-piercing pro- jectile . . . lb. Shell, H.E. . . lb. Charges { Shrapnel, lb. Shrapnel, lb.	16-63 53-13	4-37 29-86	4-37 29-86	—	—	2-332 11-706	—	—	—	—	—	—	—	—	—	—	—	—	—
Muzzle Velocity in ft. secs.	2755-9	2788-77	2788-77	3051-180	2743-20	2788-77	2786	2854	2723	2786	2788	2460	2788	2438-40	2460	2460	2460	2214	1230
Muzzle { Total tons per sq. Energy { inch . . .	18-63	17-71	17-71	—	—	17-98	—	18-37	16-86	—	18-37	15-75	18-37	—	18-37	18-37	15-75	—	12-47

305/46 A.V., "Dulio and Cesare" class; 254/45 A., "S. Giorgio" class; 254/45 V., "Pisa"; 203/53 An., 1929, "Zara" class; 203/50 S.An., "Trento" class; 190/45 A.V., "S. Giorgio and Pisa" class; 152/53 An., O.T.O., "Colleoni" class; 152/45 S., "Dulio" class; 130/50 An., "Vivaldi" class; 120/50 A.V., "Quarto" and "Cesare"; 120/45 A., "Leone"; 100/47 O.T.O., "Trento, Zara and Colleoni" class.

## JAPANESE NAVAL ORDNANCE

Date and Pattern of Gun.	K.M. (1)	V. (2)	A. (3)	V. (4)	A. (5)	A. (6)	V. (7)	— (8)	A. (9)	Carried by
Desig. by Calibre, in cms. . . . .	40·6	35·6	20·3	15·2	15·2	15·2	15·2	14	12	(1) Mutsu Class.
Calibre, in inches . . . . .	16	14	8	6	6	6	6	5·5	4·7	(2) Ise Class. Fuso Class. Kongo Class.
Total length, in feet . . . . .	..	..	..	..	..	..	..	..	..	(4) Kongo.
Length of Bore, in ins. . . . .	..	..	..	..	..	..	..	..	..	(5) Fuso Class. Kongo Class (ex- cept Kongo).
Length of Bore, in cala. . . . .	45	45	45	50	50	45	45	50	45	Yahagi. Tone.
Total weight, in tons. . . . .	..	83	17·3	8	8·7	8·5	7·5	6·25	3·3	(8) Ise Class. Mutsu Class. Kuma Class. Tenryu Class.
Weight of Firing Charge, Armour-piercing Projectile . . . . . lb.	..	..	..	..	..	..	..	..	..	(9) Tone. Yodo. Mogani.
Weight { Armour-piercing Projectile . lb., Common Shell . . . . . "	2190	1400	250	100	100	100	100	82	45	
Muzzle Velocity, in f.s., A.P. Projectile .	2780	2520	2740	3000	3000	2130	3000	2725	2988	
Muzzle Energy in foot-tons . . . . .	118,000	62,500	18,100	6300	6300	3165	6300	4250	2810	
Perforation at Muzzle, † wrought iron, inches	65	48·2	30·5	25·5	25·5	18·3	25·5	20·8	19·2	
Perforation Krupp Steel, 3000 yda. . . . .	13·8 at 10,970 metres	..	10½	6½	6½	4½	6½	..	2½	

† By Treasider's Formula.



# BETHLEHEM STEEL CO. SHIP AND COAST-DEFENCE GUNS.

Calibre.	Length of bore.	Weight of gun, including breech mechanism.		Weight of projectile.		Velocity.		Energy.		Penetration of steel-plate (De Marre).		Type of Ammunition.
		lbs.	kgs.	lbs.	kgs.	ft. per sec.	metres per sec.	foot-tons.	metre-tons.	Inches.	milli-metres.	
1-457	37	160	72.5	1-07	0.48	2,150	655	34	10.5	2-04	51.8	Fixed in cartridge case.
1-850	47	550	249.5	3-8	1.5	2,400	732	132	41	4-11	104.4	"
2-244	57	960	435.5	6-07	2.75	2,400	732	243	75	5-17	131.3	"
3	76	1950	884.5	13	5.9	2,700	823	658	204	7-71	195.8	"
4	102	2,642	1,195	33	15	2,800	853	1,795	557	11-61	294.9	"
4	102	2,642	1,195	30.86	14	3,000	914	1,928	597	12-22	310.4	"
5	127	5,080	2,299	50	22.7	3,150	960	3,440	1,067	14-56	369.8	Separate, with powder in bag.
6	152	7,112	3,223	105	47.6	2,600	792	4,926	1,523	15-47	392.9	Separate, with cartridge case.
6	152	8,534	3,868	105	47.6	2,800	853	5,713	1,767	17-19	436.6	Separate, with powder in bag.
6	152	10,280	4,660	105	47.6	3,000	914	6,559	2,028	18-97	481.8	"
7	178	12,900	5,831	165	74.8	2,700	823	8,318	2,584	19-11	485.4	"
7	178	14,730	6,687	165	74.8	2,900	884	9,631	2,982	21-16	537.5	"
8	203	18,900	8,565	260	118	2,800	853	14,148	4,379	24-15	613.4	"
8	203	22,660	10,280	260	118	2,900	884	15,177	4,703	25-38	644.6	"
9-2	234	30,890	13,999	380	172	2,900	884	22,181	6,856	28-66	727.9	"
10	254	35,970	16,319	515	234	2,800	853	28,023	8,685	30-97	786.6	"
10	254	44,600	20,230	515	234	2,900	884	30,061	9,327	32-56	827.0	"
12	305	53,800	24,399	870	395	2,800	853	47,341	14,660	37-05	941.1	"
12	305	58,400	26,450	870	395	2,900	884	50,783	15,745	38-95	989.3	"
14	356	65,650	29,780	1,400	635	2,600	792	65,687	20,317	39-69	1008.0	"
14	356	80,700	36,610	1,400	635	2,800	853	76,181	23,567	44-12	1121	"
15	381	87,880	39,840	1,700	771	2,600	792	79,763	24,668	42-35	1076	"
16	406	106,500	48,280	2,100	953	2,600	792	98,530	30,491	45-95	1167	"
16	406	130,200	59,060	2,100	953	2,800	853	114,272	35,369	51-08	1297	"
16	406	142,400	64,580	2,330	1,057	2,700	823	117,900	36,500	52-39	1331	"
18	457	152,400	69,080	3,330	1,510	2,450	747	138,734	42,979	51-71	1313	"

Guns of 4.7-in. calibre and under, equipped with the wedge-type breech mechanism, are supplied with an automatic breech-opening device, if desired.

# UNITED STATES NAVAL ORDNANCE.

GUN.	MARK.	Length in Calibres.	Total Length.	Capacity of Chamber in Cubic Inches.	Travel of Projectile in Inches.	Weight of Gun.	Weight of Projectile.	Weight of Charge.	Muzzle Velocity.	Muzzle Energy.	Penetration at Muzzle, Krupp Armour, using Projectile.
3-in. A.A.	V., VI.	50	159	219	128.8	1.0	13	8.85	2700	658	8.3
4-in. R.F.G.	III., IV., V., VI.	40	164	331	134.5	1.5	33	4.85	2000	915	3.4
4-in. R.F.G.	VII.	50	205	652	168.8	2.6	83	9.0	2500	1,430	4.6
4-in. R.F.G.	VIII.†	50	205	652	168.8	2.9	33	12.8	2800	1,794	5.8
5-in. R.F.G.	II., III., IV.	40	206	656	167.8	3.1	50	10.0	2800	1,845	5.8
5-in. B.L.R.	V., VI.	50	256	1,200	215.6	4.6	60	19.2	2700	3,032	6.2
5-in. B.L.R.	VII.	50	256	1,200	215.6	4.6	50	20.5	3000	3,122	6.4
5-in. R.F.G.	VII.†	51	261	1,135	215.6	5.0	50	23.8	3150	3,439	6.8
6-in. R.F.G.	II., III.	30	196	1,318	145.4	4.8	105	18.8	1950	2,768	5.3
6-in. R.F.G.	IV., VII.	40	256	1,320	205.8	6.0	105	18.8	2150	3,365	6.0
6-in. R.F.G.	IX.	45	270	1,320	221.7	7.0	105	18.8	2250	3,685	6.8
6-in. B.L.R.	VI.	50	300	2,101	247.5	8.8	105	30.0	2600	4,920	8.0
6-in. B.L.R.	VIII.	50	300	2,101	247.5	8.6	105	37.0	2800	5,707	8.3
7-in. B.L.R.	II.	45	328	3,643	259.8	12.7	165	58.0	2700	8,898	9.6
8-in. B.L.R.	III., IV.	35	305	3,170	245.8	13.1	260	43.8	2100	7,948	8.6
8-in. B.L.R.	V.	40	343	5,243	278.1	18.1	260	78.0	2500	11,264	10.6
8-in. B.L.R.	VI.	45	369	5,243	299.1	18.7	260	98.5	2750	13,360	12.0
10-in. B.L.R.	I., II.	30	329	6,779	251.1	25.1	510	90.0	2000	14,141	10.7
10-in. B.L.R.	III.	40	413	10,222	327.0	34.6	510	207.5	2700	23,772	15.6
12-in. B.L.R.	II.	35	441	11,991	345.2	45.8	870	160.0	2100	26,596	14.2
12-in. B.L.R.	III., IV.	40	493	17,096	392.2	52.1	870	237.5	2400	34,738	16.8
12-in. B.L.R.	III., IV.	40	493	17,096	392.2	52.1	870	305.0	2600	40,768	18.5
12-in. B.L.R.	V.	45	553	16,974	452.0	52.9	870	305.0	2700	43,964	19.4
12-in. B.L.R.	VI.	45	553	14,970	452.0	53.6	870	340.0	2850	48,984	20.8
12-in. B.L.R.	VII.	50	607	14,296	506.8	56.1	870	340.0	2850	52,488	21.7
13-in. B.L.R.	I., II.	35	479	15,068	374.9	61.4	1130	180.0	2000	31,333	15.0
14-in. B.L.R.	I.	45	642	..	..	63.6	1400	365.0	2600	65,606	39.7*
14-in. B.L.R.	II.	50	700	..	..	82.2	1400	..	2800	76,180	44.1
16-in. B.L.R.	..	45	..	..	..	105.0	2100	..	2006	98,500	45.95
16-in. B.L.R.	..	50	..	..	..	130.0	2100	..	2800	114,270	51.08

\* De Marre formula.

† All battleships from the Delaware class onward have this gun for torpedo defence.

‡ There is now a 4-in. 50-cal. anti-aircraft gun.

The U.S. Navy has a 5-in. 25-calibre A.A. gun ; a 6-in. 53-calibre gun ; and an 8-in. 55-calibre gun, but complete details are not yet published.

## SIZE AND FIGHTING QUALITIES OF BRITISH CAPITAL SHIPS OF DIFFERENT PERIODS.

Name.	Date of Completion.	Displacement.	Side Armour.	Speed.	Total Weight of Shot in One Round.	Collective Energy at Muzzle of One Round.
		tons.	in.	knots.	lb.	foot-tons.
Warrior . . . . .	1861	9,210	4½-in. wrought-iron	14½	3,800	61,476
Hercules. . . . .	1868	8,680	9-in. to 6-in. wrought-iron	14	5,400	70,200
Alexandra . . . . .	1877	9,490	12-in. to 6-in. wrought-iron	15	5,426	71,400
Inflexible . . . . .	1881	11,890	24-in. to 16-in. wrought-iron	13	6,936	123,120
Benbow . . . . .	1888	10,600	18-in. compound	16·75	4,600	135,560
Royal Sovereign . . . . .	1892	14,150	18-in. and 6-in. compound	17·5	5,800	159,610
Barfleur . . . . .	1894	10,500	12-in. compound	18·5	2,450	67,670
Canopus . . . . .	1900	12,950	6-in. hardened steel	18·25	4,600	178,720
Prince of Wales . . . . .	1902	15,000	9-in. super-hardened steel	18·25	4,600	194,400
King Edward VII. . . . .	1905	16,350	9-in. hardened steel	19	6,100	271,800
Dreadnought . . . . .	1906	17,900	11-in. hardened steel	21	8,800	487,100
Neptune. . . . .	1911	20,600	12-in. hardened steel	21·5	8,900	545,000
Ajax . . . . .	1913	25,000	12-in. hardened steel	21·5	14,500	625,000
Queen Elizabeth . . . . .	1915	27,500	13-in. hardened steel	25	15,360	638,400
Royal Sovereign . . . . .	1916	25,750	18-in. hardened steel	28	15,860	638,400
Hood . . . . .	1920	41,200	18-in. hardened steel	31	15,860	638,400
Nelson . . . . .	1927	35,000	18-in. hardened steel	23	18,432	847,458

PARTICULARS OF SUCCESSIVE LARGE BRITISH NAVAL GUNS,  
1800 to 1928.

Year.	Type.	Weight.	Length.	Calibre.	Weight of Projectile.	Weight of Charge.	Muzzle Energy.	Penetration of Wrought-iron at 1000 yards range
		tons, cwt.	in.	in.	lb.	lb.	ft.-tons.	in.
1800	Cast-iron smooth-bore . .	2 12	114	6·4	32	10	400	—
1842	Ditto . . . . .	4 15	—	8·12	68	16	700	—
1865	Woolwich wrought-iron . .	4 10	—	7	115	22	1,400	7
1870	Built-up muzzle-loader . .	38 0	200	12·50	810	200	13,900	17
1880	Ditto . . . . .	80 0	321	16	1700	450	27,960	22½
1887	Built-up breech-loader . .	110 10	524	16·25	1800	960	54,390	32
1895	Wire-wound breech-loader .	46 0	445·5	12	850	—	33,940	34·6
1900	Ditto . . . . .	51 0	496·5	12	850	210	36,290	35·4
1905	Ditto . . . . .	58 0	558	12	850	—	47,700	46·2
1912	Ditto . . . . .	76 0	626	13·5	1400	297	60,237	*50
1914 to 1920	Ditto . . . . .	100 0	650	15	1920	428	79,800	*56
1921	Ditto . . . . .	117 0	720	16	2240	—	98,230	*57
1928	Ditto . . . . .	108 0	742	16	2048	498	94,162	*60

\* At muzzle. Guns of 18-in. calibre were fitted to one cruiser during the War, but were subsequently removed and used in monitors.



## FOREIGN NAVAL AIRCRAFT TYPES.

## United States Naval Air Service.

Maker, Number, Name.	Type, Number of Seats.	Engine H.P. Make.	Max. speed, m.p.h.	Ceiling, in feet.
Martin. PM-1.	Patrol Flying Boat. Crew of 5.	Two 525 "Cyclone."	120	12,000
Boeing. F4B-3.	Single-seater Fighter.	500 "Wasp."	194	—
Curtiss. F9C-2.	Single-seater Fighter.	420 "Whirlwind"	180	—
Curtiss. F8C-4. "Helldiver."	Two-seater Fighter. Light Bomber.	450 "Wasp."	141	20,500
Curtiss. N2C-2. "Fledgling."	Two-seater Training.	240 "Whirlwind."	113	17,000
Douglas. PD-1.	Coastal Patrol Flying Boat. Crew of 4.	Two 525 "Cyclone"	121	11,600
Douglas. T2D-1.	Torpedo Bomber and G.P. Seaplane. Three-seater.	Two 525 "Cyclone."	125	—
Loening. OL-8.	Amphibian. Two-seater.	425 "Wasp."	124 Range 650 miles.	
Martin. T4M-1.	Torpedo Bomber and G.P. Three-seater.	525 "Hornet."	116	9,600
Martin. BM-2. Diving Bomber.	High performance Bomber. Two-seater.	525 "Hornet."	140	18,000
Vought. O3U. "Corsair."	Two-seater land, sea, or Amphib. Observation.	450 "Wasp."	—	—

All engines are air-cooled. "Wasp" and "Hornet" engines are made by Pratt and Whitney. "Whirlwind" and "Cyclone" engines are made by Wright.

The "Los Angeles" (LZ-126) was built by Zeppelin Co., of Friedrichshafen, and flown across the Atlantic (October, 1924) by a German crew for delivery to the United States. The "ZM-2" was manufactured by the Aircraft Development Corporation, and delivered to the U.S. Navy in September, 1929. She is used at Lakehurst for training.

**United States—continued.**

"The Akron," built by the Goodyear Zeppelin Corporation, was delivered to the U.S. Navy in the summer of 1931. She has accommodation for five scouting aircraft, and is provided with hooks for the aircraft to return to the airship. The "ZRS-5," similar to the "Akron," is under construction by the Goodyear Co. The two airships are costing £1,600,000 each.

The United States have the following shore naval bases :—Pensacola, Florida (Training); San Diego, California (Fleet Base); Hampton Roads, Virginia (Fleet Base); Lakehurst, New Jersey (Lighter-than-air craft); Pearl Harbour, Hawaii (Fleet Base); Coco-Solo, Canal Zone (Fleet Base); Anacostia, Columbia (Experimental); Seattle, Washington (Reserve Training Base).

**Japanese Naval Air Service.**

The types of aircraft in use are given as : Navy type Gamecock; Navy type 14 Reconnaissance; Navy types 13, 14 and 15 Seaplanes; F5 Patrol Flying Boat; Navy type 15 Flying Boat; and "Avro" Landplane for training.

The following further information is reported, though no further details are available: The licence for the manufacture of the "Short" flying boat has been purchased. The three-seater torpedo bomber is also used as a general purpose aircraft. All the flying boats are fitted with D/F.

Lighter-than-air craft are based on Kasumigaura. There is one airship built in Japan in 1929 which is reported to be of 7,000 cubic metres capacity and 250 feet long. They also have two "Blimps."



**French Naval Air Service.**

Lighter-than-air craft activities received a severe set back when the "Dixmude" (ex-German L27) was lost with all hands off the coast of Sicily on December 20, 1923. The French Navy is now developing two classes of airship, the "Videttes" and the "Escorteurs." The "Videttes," of which there are nine, are of about 125,000 cubic feet capacity, speed of about 40 m.p.h., a crew of four, and endurance varying from 15 to 25 hours. The "Escorteurs," of which there are four, are of about 350,000 cubic feet, have a speed of about 40 m.p.h., a crew of six, and an endurance of about 40 hours.

The bases and aerodromes of the Naval Air Service are as follows :

1st Region (Cherbourg).—Chantereyne (Escad. 1B1, Seaplanes); Querqueville (Landplanes and Captive Balloons).

2nd Region (Brest).—Lannion (Escad. 2S1, Seaplanes); Brest (Captive Balloons); Rochefort (Training); Hourtin (Training).

3rd Region (Toulon).—St. Raphael (Experimental); Berre (Escads. 3B1, 3B2, Seaplanes, and 3S1 Flying Boats); Hyères (Landplanes), 3C1.

4th Region (Bizerta).—Karouba (Escads. 4B1, 4B2, 4S1, Seaplanes); Bizerta (Captive Balloons); Bizerta-Sidi-Ahmed (Escads. 4B3, 4C1, Landplanes).

Maker, Number, Name.	Type, Number of Seats.	Engine H.P. Make.	Max. Speed, m.p.h.	Ceiling, in feet.
C.A.M.S. 46E.	Two-seater Training. Flying Boat.	140 "Hispano Suiza."	97	—
C.A.M.S. 37A.	Three-seater Recon. Amphib. or Flying Boat.	450 or 500 Geared "Lorraine" W. Pusher Airscrew.	118	14,760
C.A.M.S. 55	Bomber or Recon. Flying Boat.	Two 480 "Gnome Rhone Jupiter."	130	17,400
Farman "Goliath" F18.	Torpedo Bomber Sea- plane.	Two 480 "Gnome Rhone Jupi- ter."	92	13,000
Levasseur P.L.7.	Three-seater Torpedo Bomber.	600 "Hispano"	100 Endurance, 5 hours at cruis- ing speed.	
Levasseur P.L.10.	Three-seater Recon- naissance.	600 "Hispano Suiza."	110	Fitted with brake to lock air- screw horizontal for landing.
Nieuport Delage 62C1	Single-seater Fighter.	550 "Hispano Suiza."	156	24,000

### Italian Naval Air Service.

Lighter-than-air craft do not exist in Italy, and all experiments and research were abandoned after the disaster to General Nobile in the Italia in 1928, while making an attempt to fly over the North Pole.

Maker, Number, Name.	Type, Number of Seats.	Engine H.P. Make.	Max. Speed, m.p.h.	Celling. Endurance in hours.
Macchi. M7ter. Flying Boat	Single-seater Fighter	260 "Isotta Fraschini" V6.	124	21,300 3
Macchi. M41bis. Flying Boat	Single-seater Fighter.	410 "Fiat" A20	159	20,100 3' 5"
Fiat. CR20. Floatplane.	Single-seater Fighter. All metal.	410 "Fiat" A20.	149	20,000 3
Savoia. S62bis. Flying Boat.	Three-seater Recon- naissance.	750 "Isotta Fraschini" (Asso.).	140	14,760 10
Savoia. S59bis. Flying Boat.	Two-seater Recon- naissance.	500 "Isotta Fraschini" (Asso.).	130	14,000 4
Savoia. S55. Monoplane Flying Boat	Five-seater Twin Hull Recon- naissance or Bomber.	Two 500 "Isotta Fraschini."	118	9,200 4
Macchi. M18. Flying Boat.	Two-seater Recon- naissance.	200-250 "Isotta Fraschini" Semi (Asso.).	107	12,500 4

Italy does not at present use any supercharged engines in her Flying Services. Heavy oil engines for aircraft are being experimented with, and successful flights with them have been carried out from 1930 onwards, such engines being manufactured by Fiat. The wearing of parachutes of the "Salvator" type is compulsory for all occupants of Service Aircraft. Nearly all aircraft carry W/T transmitting and receiving sets, and a few are fitted with R/T.

MERCHANT SHIPPING  
REFERENCE SECTION.



BRITISH AND IRISH MERCHANT TONNAGE, AND UNITED STATES  
SEA-GOING MERCHANT TONNAGE, AS COMPARED WITH THE  
WORLD'S TOTAL MERCHANT FLEET.

Year.	World.	Great Britain and Ireland.	Percentage of British and Irish Tonnage to Total.	United States.*	Percentage of United States Ton- nage to Total.
	Tonnage.	Tonnage.		Tonnage.	
1890	21,118,528	10,241,856	48·5	†	—
1891	22,912,753	10,585,747	46·2	†	—
1892	23,672,698	11,157,662	47·1	1,926,426	8·1
1893	24,236,865	11,563,997	47·7	1,964,359	8·1
1894	24,547,537	11,807,010	48·1	2,171,459	8·8
1895	25,086,199	12,117,957	48·3	2,164,753	8·6
1896	25,593,186	12,293,539	48·0	2,234,725	8·7
1897	25,889,044	12,403,409	47·9	2,326,388	9·0
1898	26,543,360	12,587,904	47·4	2,448,677	9·2
1899	27,613,851	12,926,924	46·8	1,872,245	6·8
1900	28,957,358	13,241,446	45·7	2,035,062	7·0
1901	30,479,971	13,656,161	44·8	2,231,925	7·3
1902	32,302,412	14,431,072	44·7	2,342,913	7·3
1903	33,501,855	14,889,571	44·4	2,480,981	7·4
1904	34,786,132	15,391,350	44·2	2,590,349	7·4
1905	35,998,180	15,803,180	43·9	2,649,411	7·4
1906	37,550,477	16,381,350	43·6	2,672,042	7·1
1907	39,435,788	16,999,668	43·1	2,728,711	6·9
1908	40,920,551	17,318,351	42·3	2,802,387	6·8
1909	41,447,825	17,777,936	41·9	2,791,282	6·7
1910	41,912,520	17,516,479	41·8	2,761,605	6·6
1911	43,144,909	17,872,697	41·4	2,808,684	6·5
1912	44,600,677	18,213,620	40·8	2,848,829	6·4
1913	46,970,113	18,696,237	39·8	2,993,457	6·4
1914	49,089,552	19,256,766	39·2	2,970,284	6·0
1915	49,261,769	19,541,368	39·7	3,522,933	7·1
1916	48,683,136	19,134,857	39·3	3,790,578	7·8
1917†	—	—	—	—	—
1918†	—	—	—	—	—
1919	50,919,273	16,555,471	32·5	10,782,170	21·2
1920	57,314,065	18,330,424	32·0	13,789,874	24·0
1921	61,974,653	19,571,554	31·6	14,697,088	23·7
1922	64,370,786	19,295,637	30·0	14,738,506	22·9
1923	65,166,238	19,281,549	29·6	14,597,035	22·4
1924	64,023,567	19,105,838	29·8	13,530,544	21·1
1925	64,641,418	19,440,711	30·1	12,948,632	20·0
1926	64,784,370	19,399,797	29·9	12,364,668	19·1
1927	65,192,910	19,309,022	29·6	12,070,050	18·5
1928	66,954,659	19,875,350	29·6	11,997,441	17·9
1929	68,074,312	20,166,331	29·6	11,835,176	17·4
1930	69,607,644	20,438,444	29·4	11,388,367	16·4
1931	70,131,040	20,302,905	28·9	10,998,606	15·7
1932	69,734,310	19,671,675	28·2	10,889,419	15·6

\* Excluding American Great Lakes vessels.

† Figures not available.

NOTE.—Prior to 1919 the tonnages shown are the totals of gross tonnage for steam and motor vessels, and net tonnage for sailing vessels; in 1919 and subsequent years the figures are given in gross tonnage throughout.

NUMBER AND GROSS TONNAGE OF THE VESSELS OF 100 TONS  
TO EACH OF THE SEVERAL COUNTRIES OF THE

Flag.	June, 1913.†		June, 1919.		June, 1922.		
	No.	Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	
Gt. Britain and Ireland	9,214	18,696,237	7,964	16,555,471	8,849	19,295,637	
British Dominions	2,073	1,735,306	2,141	2,052,404	2,472	2,746,883	
British Empire	11,287	20,431,543	10,105	18,607,875	11,321	22,042,520	
United States of America	Sea	2,696	2,998,457	4,350	10,782,170	4,886	14,738,506
	Lakes	627	2,382,690	506	2,257,786	495	2,247,690
	Philippine Islands	77	46,489	73	51,817	99	76,264
	Total	3,400	5,427,636	4,929	13,091,773	5,480	17,062,460
Argentina	308	214,835	215	154,441	216	181,555	
Austria-Hungary	427	1,011,414	339	714,617	—	—	
Belgium	172	304,886	152	313,276	275	579,477	
Brazil	459	329,637	428	512,675	399	492,571	
Chile	131	139,792	114	101,647	126	131,401	
China	66	86,690	102	132,515	134	188,388	
Cuba	59	61,536	51	47,295	65	62,677	
Denmark	811	762,054	645	702,436	822	1,038,138	
Estonia	—	—	—	—	98	45,259	
Finland	—	—	338	180,962	352	213,671	
France	1,552	2,201,164	1,440	2,233,631	2,094	3,845,792	
Germany	2,321	5,082,061	1,768	3,503,380	1,723	1,887,408	
Greece	442	722,782	312	323,796	379	668,127	
Holland	759	1,309,849	931	1,591,911	1,164	2,632,713	
Italy	1,114	1,521,942	858	1,370,097	1,413	2,866,335	
Japan*	1,037	1,500,014	1,418	2,325,266	2,026	3,586,918	
Jugo-Slavia	—	—	‡	‡	‡	‡	
Latvia	—	—	—	—	67	40,124	
Norway	2,191	2,457,890	1,629	1,857,829	1,852	2,600,861	
Peru	60	45,514	63	79,342	74	101,209	
Portugal	208	120,579	227	261,212	286	285,878	
Roumania	33	45,408	35	63,792	31	72,297	
Russia	1,216	974,178	618	541,005	—	—	
Spain	607	840,995	576	750,611	973	1,282,757	
Sweden	1,436	1,047,270	1,263	992,611	1,345	1,115,375	
Turkey	272	157,298	161	116,249	—	—	
Other Countries and flag not recorded	158	98,115	495	304,530	1,167	1,270,564	
Total	30,591	46,970,113	29,255	50,919,273	33,935	64,370,786	

\* Japanese sailing vessels are not recorded in Lloyd's Register Book.

† In 1913 the figure shown is the total of the gross tonnage of steam and motor vessels, and the net tonnage of sailing vessels; in 1919 and subsequent years the figure is given in gross tons throughout.

‡ Figures included in total for "Other countries."

GROSS AND UPWARDS (STEAM, SAIL, AND MOTOR) BELONGING  
WORLD, AS RECORDED IN LLOYD'S REGISTER.

June, 1926.		June, 1929.		June, 1931.		June, 1932.	
No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.
8,369	19,399,797	8,172	20,166,331	8,157	20,302,905	7,971	19,671,675
2,477	2,870,327	2,507	2,949,816	2,529	3,077,094	2,547	3,112,708
10,864	22,270,124	10,679	23,116,147	10,686	23,379,999	10,518	22,784,383
4,001	12,364,668	3,696	11,835,176	3,318	10,998,606	3,252	10,889,419
529	2,433,049	576	2,541,938	574	2,545,341	574	2,552,532
97	81,044	111	104,908	120	98,236	120	104,669
4,627	14,878,761	4,383	14,482,022	4,007	13,642,133	3,946	13,546,620
242	234,848	311	296,236	340	327,980	345	336,771
225	507,473	244	529,043	238	547,470	240	537,442
361	482,308	391	560,680	311	498,789	309	496,130
133	179,712	119	154,563	116	184,298	111	178,680
201	299,806	218	319,224	234	333,256	250	371,153
72	61,735	66	45,270	59	42,721	61	44,016
771	1,081,146	701	1,055,867	717	1,145,257	730	1,180,620
115	49,025	116	60,883	137	93,397	146	106,017
363	232,792	348	298,323	318	312,097	324	332,385
1,769	3,490,606	1,662	3,378,663	1,653	3,566,227	1,644	3,557,006
1,986	3,110,918	2,127	4,092,552	2,171	4,254,601	2,151	4,164,842
467	924,944	516	1,266,685	539	1,397,782	551	1,470,064
1,109	2,564,904	1,339	2,939,067	1,429	3,118,170	1,445	2,963,840
1,401	3,240,630	1,380	3,284,660	1,347	3,335,673	1,323	3,390,572
2,087	3,967,617	2,059	4,186,652	1,969	4,276,341	1,964	4,255,014
137	195,787	153	281,396	181	361,606	185	381,045
87	67,783	108	150,159	127	206,686	114	188,479
1,844	2,841,905	1,807	3,224,493	1,990	4,065,506	2,008	4,166,839
46	79,068	38	62,160	39	64,686	39	64,686
285	280,116	269	246,368	261	276,357	259	269,013
37	68,173	34	68,647	31	65,921	33	74,104
370	323,234	379	440,506	386	603,836	449	685,144
924	1,163,008	877	1,161,591	842	1,227,370	861	1,265,321
1,380	1,338,089	1,385	1,510,125	1,428	1,704,669	1,433	1,715,984
174	136,796	189	172,096	190	179,287	189	178,053
468	637,799	584	690,734	598	918,875	619	1,030,087
32,615	64,784,370	32,482	68,074,312	32,344	70,131,040	32,247	69,734,310

\* Japanese sailing vessels are not recorded in Lloyd's Register Book.

† Figures included in total for "Other Countries."



NUMBERS OF STEAMERS AND MOTORSHIPS OWNED BY THE  
PRINCIPAL MARITIME COUNTRIES ON JUNE 30, 1932, BY  
DIVISIONS OF AGE.

Country.	Numbers of Vessels owned of Various Ages.						Total Number of Vessels owned.	Percentage of Total Number of Ships under 5 years old.
	Under 5 years.	5 years and under 10 years.	10 years and under 15 years.	15 years and under 20 years.	20 years and under 25 years.	25 years and over.		
Gt. Brit. & Ireland	1,124	1,111	1,495	1,246	855	1,761	7,592	14·8
British Dominions	289	354	374	233	307	623	2,180	13·3
United States *	140	132	1,461	266	185	510	2,694	5·2
Denmark . . .	90	101	186	79	53	193	702	12·8
France . . .	141	123	439	194	206	415	1,518	9·3
Germany . . .	220	340	526	251	247	551	2,135	10·3
Holland . . .	295	200	293	259	132	245	1,424	20·7
Italy . . .	91	120	222	99	132	427	1,091	8·3
Japan . . .	226	186	687	262	129	474	1,964	11·5
Norway . . .	336	244	427	240	231	523	2,001	16·8
Spain . . .	76	42	225	56	47	347	793	9·6
Sweden . . .	82	75	221	147	108	720	1,353	6·1
Other Countries .	433	202	516	363	473	1,959	3,946	11·0
World Total* .	3,543	3,230	7,072	3,695	3,105	8,748	29,393	12·0

\* Excluding American Great Lakes vessels.

NUMBERS OF STEAMERS AND MOTORSHIPS OWNED BY THE PRIN-  
CIPAL MARITIME COUNTRIES ON JUNE 30, 1932, BY DIVISIONS OF  
GROSS TONNAGE.

Country.	Numbers of Vessels Owned of Various Gross Tonnages.										Total Number of Vessels owned.	Percentage of Total Number of Vessels of 6000 gross tons and over.
	100 tons and under 500 tons.	500 tons and under 1000 tons.	1000 tons and under 2000 tons.	2000 tons and under 4000 tons.	4000 tons and under 6000 tons.	6000 tons and under 8000 tons.	8000 tons and under 10,000 tons.	10,000 tons and under 15,000 tons.	15,000 tons and under 20,000 tons.	20,000 tons and over.		
Gt. Brit. & Ireland	3,330	662	689	703	1,245	545	199	135	50	34	7,592	12·7
British Dominions	1,056	295	390	252	116	43	12	12	2	2	2,180	3·3
United States *	622	148	180	469	641	453	115	48	9	9	2,694	23·5
Denmark . . .	221	83	222	100	45	13	13	5	—	—	702	4·4
France . . .	681	111	151	243	181	62	52	25	6	6	1,518	9·9
Germany . . .	1,020	287	247	211	160	124	53	18	6	9	2,135	9·9
Holland . . .	738	72	146	190	97	106	52	14	7	2	1,424	12·7
Italy . . .	344	91	101	182	231	97	23	8	2	12	1,091	13·0
Japan . . .	747	206	236	364	256	100	36	16	3	—	1,964	7·9
Norway . . .	747	194	427	220	219	135	44	13	2	—	2,001	9·7
Spain . . .	371	79	85	186	44	18	3	7	—	—	793	3·5
Sweden . . .	604	174	364	115	65	13	12	2	3	1	1,353	2·3
Other Countries .	1,528	569	626	718	380	74	29	22	—	—	3,946	3·2
World Total * .	12,009	2,971	3,864	3,953	3,680	1,783	643	325	90	75	29,393	9·9

\* Excluding American Great Lakes vessels.

NUMBER AND TONNAGE OF MOTORSHIPS (EXCLUDING VESSELS FITTED  
WITH AUXILIARY MOTORS) OWNED BY VARIOUS NATIONS.

	June, 1923.		June, 1927.		June, 1930.		June, 1931.		June, 1932.	
	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.
Gt. Brit. & Ireland	189	374,873	291	1,167,301	458	2,246,166	490	2,511,777	511	2,609,564
British Dominions	44	14,084	100	94,959	167	174,939	204	206,690	221	195,038
United States *	97	139,786	188	349,786	258	600,453	274	660,166	288	681,590
Denmark	40	132,542	68	219,246	89	341,503	105	395,122	117	426,607
France	34	27,958	26	34,877	46	139,186	60	179,548	72	194,952
Germany	45	84,528	112	315,141	183	537,261	198	579,478	211	591,158
Holland	52	66,577	85	192,807	272	534,873	335	667,504	400	715,827
Italy	34	61,374	64	363,822	112	494,709	123	535,224	131	576,314
Japan	20	4,375	73	99,290	157	385,097	188	492,871	220	548,976
Norway	130	177,071	197	580,551	292	1,272,847	345	1,628,209	366	1,738,572
Spain	8	13,378	25	45,927	47	117,940	57	157,804	66	209,907
Sweden	103	173,697	119	295,646	143	459,039	151	518,610	151	526,719
Other countries	78	45,688	120	207,718	244	472,960	289	590,250	336	716,903
World's total *	819	1,315,931	1,468	3,966,571	2,469	7,789,539	2,814	9,123,253	3,090	9,730,517

\* Excluding American Great Lakes vessels.

**STEAMSHIP AND MOTORSHIP TONNAGE (INCLUDING AUXILIARIES)  
OWNED BY VARIOUS COUNTRIES, AS AT JUNE, 1932**

Country.	Steamships.			Motorships.		
	No.	Gross tonnage.	Percentage of total steamship and motorship tonnage.	No.	Gross tonnage.	Percentage of total steamship and motorship tonnage.
Gt. Britain and Ireland	7,007	16,939,348	86.6	585	2,622,795	13.4
British Dominions	1,863	2,748,953	92.6	317	220,845	7.4
British Empire	8,870	19,688,301	87.4	902	2,843,640	12.6
United States *	2,381	9,576,627	93.2	313	693,724	6.8
Denmark	498	727,524	62.2	204	443,751	37.8
France	1,408	3,304,202	94.2	110	203,323	5.8
Germany	1,642	3,502,469	84.5	493	640,451	15.5
Holland	921	2,225,864	75.3	503	731,331	24.7
Italy	883	2,733,515	82.1	208	597,789	17.9
Japan	1,614	3,684,637	86.6	350	570,377	13.4
Norway	1,582	2,415,986	58.0	419	1,747,850	42.0
Spain	675	1,032,087	82.6	118	218,041	17.4
Sweden	1,054	1,141,095	67.5	299	550,158	32.5
Other countries	3,455	5,881,998	88.4	491	767,971	11.6
World's Total*	24,983	55,914,305	84.8	4,410	10,008,406	15.2

\* Excluding American Great Lakes vessels.

**NUMBER AND GROSS TONNAGE OF MOTORSHIPS OF OVER 8,000 TONS  
GROSS, OWNED BY VARIOUS NATIONS, AS AT JUNE, 1932.**

Country.	8,000 and under 10,000 tons gross.		10,000 and under 15,000 tons gross.		15,000 tons gross and above.		Total over 8,000 tons gross.	
	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.
Great Britain and Ireland	61	535,254	21	243,189	13	261,593	95	1,040,036
British Dominions	4	35,181	5	57,373	—	—	9	92,554
United States	22	195,303	6	66,008	—	—	28	261,311
Denmark	9	78,176	3	30,851	—	—	12	109,027
France	3	27,922	3	34,607	3	57,452	9	119,981
Germany	7	63,647	6	78,717	2	33,431	15	175,795
Holland	26	223,352	6	68,672	5	87,833	37	379,857
Italy	7	62,154	3	36,455	5	120,560	15	219,169
Japan	13	115,841	5	58,719	3	51,448	21	226,008
Norway	40	358,926	2	24,413	—	—	42	383,339
Russia	2	16,456	—	—	—	—	2	16,456
Spain	—	—	3	36,011	—	—	3	36,011
Sweden	12	106,609	1	10,409	4	68,651	17	185,669
Other countries	14	123,652	14	168,026	—	—	28	291,678
World's Total	220	1,942,473	78	913,450	35	680,968	333	3,536,891



NUMBER AND TONNAGE OF TANKERS OWNED BY VARIOUS NATIONS.\*

	June, 1923.		June, 1925.		June, 1927.		June, 1929.		June, 1931.		June, 1932.	
	No.	Tons gross.	No.	Tons gross.	No.	Tons gross.	No.	Tons gross.	No.	Tons gross.	No.	Tons gross.
Great Britain and Ireland . . . .	312	1,691,257	315	1,708,978	352	1,934,186	388	2,165,208	405	2,353,327	393	2,316,425
British Dominions. . . . .	39	196,639	34	185,836	34	181,041	39	227,969	48	268,983	49	267,129
British Empire . . . . .	351	1,887,896	349	1,894,814	386	2,115,227	427	2,393,177	453	2,622,310	442	2,583,554
United States . . . . .	399	2,497,625	374	2,281,324	374	2,293,539	381	2,374,358	394	2,513,070	393	2,518,544
Belgium . . . . .	7	36,471	7	34,982	6	39,533	8	46,305	9	59,900	9	60,348
Denmark . . . . .	2	11,561	2	9,647	3	12,660	9	59,475	12	80,068	12	84,450
France . . . . .	19	105,233	28	151,089	27	146,872	29	169,298	35	205,222	38	221,300
Germany . . . . .	9	36,675	12	55,754	20	94,258	26	125,387	32	149,683	29	136,977
Holland . . . . .	35	115,804	46	148,109	58	199,110	74	261,255	84	336,196	79	334,604
Italy . . . . .	18	89,399	28	128,904	45	205,871	57	255,020	76	355,745	77	367,021
Japan . . . . .	10	64,036	8	47,137	9	47,631	13	76,911	19	120,110	20	122,337
Norway . . . . .	33	178,368	42	243,455	63	403,812	117	781,575	204	1,450,470	217	1,539,348
Spain . . . . .	8	30,604	8	30,648	8	30,602	8	30,602	8	35,228	15	77,880
Sweden . . . . .	2	6,599	2	4,873	3	16,270	7	49,127	17	134,490	17	141,369
Other countries . . . . .	24	100,652	33	146,894	48	241,801	80	365,432	96	487,335	110	621,089
World's Total . . . . .	917	5,160,923	939	5,177,630	1,060	5,847,086	1,236	6,987,922	1,439	8,549,827	1,458	8,808,821

\* Excluding Tankers of less than 1,000 tons gross.

## NUMBER AND TONNAGE OF MERCHANT VESSELS LAUNCHED.\*

	1913.		1910.		1923.		1925.		1929.		1932 (1st 9 months).	
	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.
Gt. Britain and Ireland .	688	1,932,153	612	1,620,442	222	645,651	342	1,084,633	489	1,522,623	83	152,463
British Dominions .	77	26,744	235	298,496	41	37,072	47	32,220	47	21,327	9	3,312
United States † .	182	228,232	852	3,579,826	69	96,491	94	78,766	59	100,632	13	110,700
Denmark .	31	40,932	46	37,766	24	49,479	21	73,268	34	111,496	9	17,235
France .	89	176,095	34	32,633	27	96,644	35	75,569	16	81,607	14	8,455
Germany .	162	465,226	No returns.		109	345,062	121	406,374	85	249,077	10	54,992
Holland .	95	104,296	100	137,086	35	65,632	47	78,823	77	186,517	10	24,406
Italy .	38	50,356	32	32,713	21	66,523	31	142,046	32	71,497	7	34,635
Japan .	152	64,664	133	611,883	44	72,475	23	55,784	40	164,457	27	48,920
Norway .	74	50,637	82	57,578	48	42,619	48	28,805	51	39,604	6	8,020
Spain .	12	8,488	41	52,609	7	4,488	1	127	8	37,023	2	9,300
Sweden .	25	18,524	53	50,971	10	20,118	17	53,750	29	107,246	7	31,680
Other Countries .	88	96,724	36	26,755	27	20,410	17	19,371	38	62,859	3	3,030
World's Total .	1713	3,282,071	2256	6,588,757	684	1,562,664	844	2,129,536	1005	2,755,965	200	507,148

\* Figures given include all steamers, motorships, and sailing vessels of 100 gross tons and upwards.

† Excluding vessels built at ports on the Great Lakes of America.

## MERCHANT VESSELS UNDER CONSTRUCTION.\*

	1913.		1919.		1925.		1932.	
	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.
Gt. Britain and Ireland . .	508	1,987,254	781	2,816,773	257	1,009,155	341	1,448,855
British Dominions . .	67	36,923	151	254,632	23	32,047	32	33,978
United States † . .	60	121,304	641	3,161,714	36	69,866	26	96,010
Denmark . .	11	25,257	45	68,074	18	70,760	19	80,855
France . .	42	249,595	64	174,736	36	150,220	19	135,776
Germany . .	92	535,555	No returns.		73	306,626	66	235,499
Holland . .	50	128,730	113	288,042	44	127,775	55	234,029
Italy . .	19	56,126	108	285,928	40	269,802	36	69,884
Japan . .	17	64,905	64	299,600	13	53,270	23	156,810
Norway . .	45	41,746	73	83,941	22	19,770	25	32,870
Spain . .	4	2,880	26	90,705	5	11,427	13	45,137
Sweden . .	13	16,665	64	101,217	20	71,580	31	111,427
Other Countries . .	22	89,086	49	60,353	22	14,607	16	19,191
World's Total . .	968	3,368,054	2179	7,685,715	609	2,206,905	739	2,801,339
							192	901,067

\* The figures give the number and aggregate gross tonnage of steamers, motorships, and sailing vessels under construction on September 30 of each year.

† Excluding vessels building at ports on the Great Lakes of America.



## ANNUAL MERCHANT SHIPPING LOSSES OF THE WORLD.\*

	1913.			1919.			1924.			1929.			1930.			1931.		
	No.	Tonnage.	% of Tonnage owned.	No.	Tonnage.	% of Tonnage owned.	No.	Tonnage.	% of Tonnage owned.	No.	Tonnage.	% of Tonnage owned.	No.	Tonnage.	% of Tonnage owned.	No.	Tonnage.	% of Tonnage owned.
Gt. Brit. & Ireland	113	199,453	1·07	99	151,653	·92	74	111,207	·58	61	113,420	·56	48	100,523	·49	48	85,080	·17
British Dominions	37	20,091	1·16	89	52,539	2·56	61	41,325	1·49	50	41,253	1·40	34	8,440	·29	28	28,819	·94
United States †	91	71,469	2·38	115	150,272	1·15	64	87,418	·65	44	78,103	·66	40	49,451	·43	20	27,714	·25
Denmark	13	6,583	·86	15	5,295	·75	13	14,198	1·37	10	11,066	1·05	9	7,154	·66	4	4,196	·37
France	30	34,506	1·57	34	40,420	1·81	25	27,726	·79	32	33,291	·99	17	13,186	·37	18	17,094	·48
Germany	31	56,379	1·11	50	24,167	—	26	23,095	·78	29	34,243	·84	15	30,596	·72	13	10,207	·24
Holland	4	1,340	·10	23	11,550	·73	1	801	·03	4	2,689	·09	5	14,238	·46	8	9,379	·30
Italy	26	26,881	1·77	8	3,096	·23	16	38,810	1·37	26	38,226	1·16	18	16,398	·49	17	25,068	·75
Japan †	25	25,514	1·7	38	41,418	1·77	42	70,933	1·85	33	67,082	1·60	41	64,870	1·50	37	54,011	1·26
Norway	61	60,548	2·47	41	44,132	2·37	22	23,786	·95	30	25,460	·79	18	24,615	·67	14	17,681	·43
Spain	13	15,928	1·89	16	9,752	1·30	10	10,181	·82	9	16,805	1·45	14	9,600	·78	7	9,334	·76
Sweden	30	17,927	1·65	38	29,021	2·92	16	16,627	1·33	11	8,286	·55	13	12,419	·76	12	9,252	·54
Other Countries	36	42,686	—	65	54,719	—	52	65,438	—	64	86,302	—	45	63,320	—	58	88,273	—
World's Total	542	608,235	—	635	622,805	—	422	531,545	—	403	556,126	—	317	414,810	—	279	336,108	—

\* Figures refer to steam, motor, and sailing vessels of 100 gross tons and over totally lost, condemned, etc. The tonnage given is gross for steamers and motorships, and net for sailing ships up to and including the returns for 1919; in subsequent returns the tonnage is gross for steamers, motorships, and sailing ships.

† Japanese sailing vessels not included.

‡ Excluding ships trading on the Great Lakes of America.



## LARGEST MERCHANT VESSELS OF THE WORLD.

A list of all vessels of 10,000 tons gross or more arranged in order of gross tonnage.

(T.=turbine engines; M.=oil engines; T. &amp; R.=turbines &amp; reciprocating engines; T.E.=turbo-electric.)

Gross tonnage.	Name.	Speed † (knots.)	Date built.	Flag.	Owners.	L.* (ft.)	B.* (ft.)	D.* (ft.)
56,621	Majestic (T.) . . . . .	25	1921	Br.	White Star Line . . . . .	915.5	100.1	58.2
52,226	Berengaria (T.) . . . . .	23	1912	Br.	Cunard Line . . . . .	883.6	98.3	57.2
51,656	Bremen (T.) . . . . .	26	1929	Ger.	Norddeutscher Lloyd . . . . .	898.7	101.9	48.1
51,062	Rex (T.) . . . . .	—	1932	Ital.	Italia Line . . . . .	833.8	97.1	47.3
49,746	Europa (T.) . . . . .	26	1928	Ger.	Norddeutscher Lloyd . . . . .	890.2	102.1	48.0
48,943	Leviathan (T.) . . . . .	25	1914	U.S.	United States Lines . . . . .	907.6	100.3	58.0
48,500	Conte di Savoia (T.) . . . . .	—	1932	Ital.	Italia Line . . . . .	790.0	96.0	48.6
46,439	Olympic (T. & R.) . . . . .	22½	1911	Br.	White Star Line . . . . .	852.5	92.5	59.5
45,647	Aquitania (T.) . . . . .	23	1914	Br.	Cunard Line . . . . .	868.7	97.0	49.7
43,153	Ile de France (T.) . . . . .	23	1926	Fr.	C.G.T. (French Line) . . . . .	763.7	92.0	55.9
42,512	L'Atlantique (T.)† . . . . .	24	1930	Fr.	Cie. de Nav. Sud-Atlantique . . . . .	713.6	91.8	57.7
42,348	Empress of Britain (T.) . . . . .	24	1930	Br.	Canadian Pacific . . . . .	733.3	97.8	56.0
34,569	Paris (T.) . . . . .	21½	1921	Fr.	C.G.T. (French Line) . . . . .	735.4	85.3	59.1
34,351	Homeric . . . . .	20	1922	Br.	White Star Line . . . . .	751.0	83.3	48.6
32,650	Augustus (M.) . . . . .	19	1927	Ital.	Italia Line . . . . .	666.3	82.8	47.2
32,583	Roma (T.) . . . . .	21	1926	Ital.	Italia Line . . . . .	664.7	82.6	51.5
32,565	Columbus (T.) . . . . .	21	1922	Ger.	Norddeutscher Lloyd . . . . .	749.6	83.1	49.4
30,696	Mauretania (T.) . . . . .	25	1907	Br.	Cunard Line . . . . .	762.2	88.0	57.1
30,000	Washington (T.) . . . . .	—	1932	U.S.	United States Lines . . . . .	666.0	—	—
29,511	Statendam (T.) . . . . .	18	1926	Holl.	Holland-Amerika Line . . . . .	670.4	81.4	49.4
28,912	Champlain (T.) . . . . .	—	1931	Fr.	C.G.T. (French Line) . . . . .	607.0	82.8	67.8
27,759	Georgic (M.) . . . . .	—	1932	Br.	White Star Line . . . . .	683.6	82.4	48.6
27,561	Cap Arcona (T.) . . . . .	20	1927	Ger.	Hamburg Sud-Amerika Line . . . . .	643.6	84.6	41.9
27,132	Belgenland (T. & R.) . . . . .	17½	1917	Br.	F. Leyland & Co. . . . .	670.4	78.4	44.7
26,943	Britannic (M.) . . . . .	18	1930	Br.	White Star Line . . . . .	683.6	82.4	48.6
26,032	Empress of Japan (T.) . . . . .	—	1930	Br.	Canadian Pacific . . . . .	644.0	83.8	44.5
25,661	Conte Grande (T.) . . . . .	21	1928	Ital.	Italia Line . . . . .	652.2	78.3	27.3
25,178	Lafayette (M.) . . . . .	17	1929	Fr.	C.G.T. (French Line) . . . . .	577.2	77.6	27.9
24,679	Adriatic . . . . .	18	1906	Br.	White Star Line . . . . .	709.2	75.5	52.6
24,416	Conte Biancamano (T.) . . . . .	20	1925	Ital.	Italia Line . . . . .	650.9	76.1	27.5
24,289	Manhattan (T.) . . . . .	—	1932	U.S.	United States Lines . . . . .	668.4	86.3	33.3
24,281	Duilio (T.) . . . . .	21	1923	Ital.	Italia Line . . . . .	602.4	76.3	46.3
24,149	Rotterdam . . . . .	17	1908	Holl.	Holland-Amerika Line . . . . .	650.5	77.4	43.5
23,970	Vulcania (M.) . . . . .	19	1927	Ital.	Cosulich Line . . . . .	599.0	79.5	46.5
23,940	Saturnia (M.) . . . . .	19	1927	Ital.	Cosulich Line . . . . .	606.2	79.8	46.5
23,884	Baltic . . . . .	17	1904	Br.	White Star Line . . . . .	709.2	75.6	52.6
23,788	George Washington . . . . .	18	1908	U.S.	U.S. Shipping Board . . . . .	699.1	78.2	50.1
23,769	France (T.) . . . . .	22½	1912	Fr.	C.G.T. (French Line) . . . . .	690.1	75.6	48.5
22,547	Strathnaver (T.E.) . . . . .	20½	1931	Br.	P. & O. . . . .	638.7	80.2	33.1
22,544	Strathaird (T.E.) . . . . .	20½	1932	Br.	P. & O. . . . .	638.0	80.0	33.0
22,500	Queen of Bermuda (T.E.) . . . . .	—	1932	Br.	Furness Withy . . . . .	553.2	76.7	39.0
22,424	Monarch of Bermuda (T.E.) . . . . .	—	1931	Br.	Furness Withy . . . . .	553.2	76.7	39.0
22,181	Alcantara (M.) . . . . .	17½	1926	Br.	Royal Mail . . . . .	630.5	78.5	40.5
22,071	Asturias (M.) . . . . .	17½	1925	Br.	Royal Mail . . . . .	630.5	78.5	40.5
21,998	Minnetonka (T.) . . . . .	16½	1924	Br.	Atlantic Transport Line . . . . .	600.8	80.4	49.4
21,936	President Hoover (T.E.) . . . . .	21	1930	U.S.	Dollar S.S. Lines . . . . .	615.0	81.0	52.0
21,936	President Coolidge (T.E.) . . . . .	21	1931	U.S.	Dollar S.S. Lines . . . . .	615.0	81.0	52.0
21,867	New York (T.) . . . . .	18½	1927	Ger.	Hamburg-Amerika Line . . . . .	602.5	79.0	42.1
21,833	Empress of Australia (T.) . . . . .	18	1914	Br.	Canadian Pacific . . . . .	589.9	75.2	41.5
21,716	Minnewaska (T.) . . . . .	16½	1923	Br.	Atlantic Transport Line . . . . .	600.8	80.4	49.4
21,691	Hamburg (T.) . . . . .	18½	1925	Ger.	Hamburg-Amerika Line . . . . .	602.5	78.7	51.6
21,657	Giulio Cesare (T.) . . . . .	19	1921	Ital.	Italia Line . . . . .	602.4	76.5	46.3
21,517	Empress of Canada (T.) . . . . .	20	1922	Br.	Canadian Pacific . . . . .	627.0	77.9	42.2
21,329	America . . . . .	17	1905	U.S.	U.S. Shipping Board . . . . .	668.8	74.3	47.8
21,011	Cap Polonio (T. & R.) . . . . .	18	1914	Ger.	Hamburg Sud-Amerika Line . . . . .	637.8	72.4	39.5
20,952	Mooltan (R. & T.E.) . . . . .	17½	1923	Br.	P. & O. . . . .	600.8	73.4	48.6
20,931	Albert Ballin (T.) . . . . .	18½	1923	Ger.	Hamburg-Amerika Line . . . . .	602.4	78.7	41.9
20,914	Maloja (T. & R.) . . . . .	17½	1923	Br.	P. & O. . . . .	600.8	73.4	48.6
20,773	Virginia (T.E.) . . . . .	18	1928	U.S.	American Line S.S. Corp. . . . .	586.4	80.3	52.0
20,742	Deutschland (T.) . . . . .	18½	1923	Ger.	Hamburg-Amerika Line . . . . .	602.4	72.2	41.9
20,526	Pennsylvania (T.E.) . . . . .	18½	1929	U.S.	American Line S.S. Corp. . . . .	586.0	80.3	20.5
20,445	Warwick Castle (M.) . . . . .	18	1930	Br.	Union Castle Line . . . . .	651.5	75.5	37.4
20,325	California (T.E.) . . . . .	18	1928	U.S.	American Line S.S. Corp. . . . .	574.4	80.3	52.0
20,277	Carinthia (T.) . . . . .	16½	1925	Br.	Cunard Line . . . . .	600.7	73.8	40.7
20,223	Kungsholm (M.) . . . . .	17	1928	Swed.	Svenska-Amerika Line . . . . .	594.9	78.2	37.8
20,175	Francia (T.) . . . . .	16½	1923	Br.	Cunard Line . . . . .	601.3	73.7	40.6
20,123	Duchess of Bedford (T.) . . . . .	17½	1928	Br.	Canadian Pacific . . . . .	581.9	75.2	41.8

\* The registered dimensions are measured as follows: Length from fore part of stem at extreme top to aft side of head of stern post, or centre of rudder stock if a balanced rudder is fitted; Breadth is taken to outside of plating; Depth from top of beam at centre line of tonnage deck amidships to ceiling. If there is no ceiling it is measured to the tank top. If there are more than two decks, the tonnage deck is the second deck, counting from below.

† The speeds shown in this Table are as given by the owners.

‡ Destroyed by fire on January 5, 1933.

## LARGEST MERCHANT VESSELS OF THE WORLD—continued.

Gross tonnage.	Name.	Speed † (knots).	Date built.	Flag.	Owners.	L.* (ft.)	B.* (ft.)	D.* (ft.)
20,119	Duchess of Atholl (T.)	17½	1928	Br.	Canadian Pacific	580-0	75-3	41-8
20,109	Winchester Castle (M.)	18	1930	Br.	Union Castle Line	631-6	75-5	37-5
20,063	Carnarvon Castle (M.)	18	1926	Br.	Union Castle Line	630-7	73-5	37-5
20,032	Otranto (T.)	18	1925	Br.	Orient Line	632-0	75-2	32-9
20,022	Duchess of Richmond (T.)	18	1928	Br.	Canadian Pacific	581-9	75-2	41-7
20,021	Duchess of York (T.)	18	1929	Br.	Canadian Pacific	581-9	75-2	41-7
20,001	Orousay (T.)	18	1925	Br.	Orient Line	633-6	75-2	33-0
20,000	Oceania (M.)	—	1932	Ital.	Cosulich Line	556-0	—	—
19,970	Orontes (T.)	18	1925	Br.	Orient Line	632-0	75-2	33-0
19,970	Orford (T.)	18	1927	Br.	Orient Line	632-2	75-4	33-1
19,941	Roliance (T. & R.)	17	1920	Ger.	Hamburg-Amerika Line	590-4	72-3	39-7
19,821	Orama (T.)	18	1920	Br.	Orient Line	632-0	75-2	32-9
19,777	Scythia (T.)	16½	1920	Br.	Cunard Line	600-7	73-8	40-7
19,761	Laconia (T.)	16½	1922	Br.	Cunard Line	601-3	73-7	40-6
19,695	Viceroy of India (T.E.)	16½	1928	Br.	P. & O.	582-7	76-0	45-5
19,648	Samaria (T.)	16½	1921	Br.	Cunard Line	601-5	73-7	40-7
19,597	Resolute (T. & R.)	17	1920	Ger.	Hamburg-Amerika Line	590-4	72-2	40-2
19,464	Neptunia (M.)	—	1932	Ital.	Cosulich Line	556-0	—	—
19,457	Monticello	23½	1902	U.S.	U.S. Shipping Board	684-3	72-3	40-2
19,361	Marix v. St. Audegonde (M.)	17	1929	Holl.	Nederland Stoom. Maats.	580-0	74-0	47-3
19,129	Johan v. Oldenbarnevelt (M.)	17	1929	Holl.	Nederland Stoom. Maats.	580-0	74-6	47-3
19,040	Arundel Castle (T.)	18	1921	Br.	Union Castle Line	630-5	72-5	41-5
19,023	Windsor Castle (T.)	18	1922	Br.	Union Castle Line	632-4	72-5	41-6
18,967	Albertic	16½	1923	Br.	White Star Line	590-8	72-0	37-6
18,940	Lapland	17	1908	Br.	F. Leyland & Co.	605-8	70-4	37-4
18,866	Conte Verde (T.)	19	1923	Ital.	Italia Line	570-2	74-2	35-9
18,724	Laurentic (T. & R.)	17	1927	Br.	White Star Line	578-2	75-4	40-6
18,495	Ceramic (T. & R.)	16	1913	Br.	White Star Line	655-1	69-4	43-8
18,452	Empress of France (T.)	19	1913	Br.	Canadian Pacific	571-4	72-4	41-7
18,435	De Grasse (T.)	16	1924	Fr.	C.G.T. (French Line)	552-1	71-4	42-3
18,372	Mount Vernon	23½	1906	U.S.	U.S. Shipping Board	685-4	72-2	40-5
18,017	Mariposa (T.)	22	1931	U.S.	Oceanic S.S. Co.	604-0	79-3	30-5
18,017	Monterey (T.)	—	1932	U.S.	Oceanic S.S. Co.	604-0	79-3	30-5
18,000	Lurline (T.)	—	1932	U.S.	Oceanic S.S. Co.	604-0	79-3	30-5
17,801	Kosmos	—	1929	Nor.	Kosmos A/S.	554-1	77-2	49-6
17,716	Gripsholm (M.)	17	1925	Swed.	Svenska-Amerika Line	553-0	74-4	37-7
17,707	Reina del Pacifico (M.)	19	1930	Br.	Pacific Stm. Nav. Co.	551-0	76-3	38-5
17,498	Chichibu Maru (M.)	19	1930	Jap.	Nippon Yusen Kaisha	560-0	74-0	42-5
17,491	Aorangi (M.)	17	1924	Br.	Canadian-Australasian Line	580-1	72-2	43-4
17,400	Aramis (M.)	—	1931	Fr.	Messageries Maritimes	542-6	69-6	47-0
17,231	Minnekahda (T. & R.)	16	1917	U.S.	Atlantic Transport Line	620-5	66-4	47-3
17,282	Malolo (T.)	22	1926	U.S.	Matson Nav. Co.	554-0	83-0	54-0
17,048	Conte Rosso (T.)	19	1922	Ital.	Italia Line	570-2	74-2	35-9
17,046	Caledonia (T.)	16½	1925	Br.	Anchor Line	553-0	70-4	38-7
16,991	Tuscania (T.)	15½	1922	Br.	Anchor Line	552-3	70-3	38-6
16,981	Baloeran (M.)	18	1929	Holl.	Rotterdam Lloyd	550-0	70-0	44-0
16,979	Dempo (M.)	18	1930	Holl.	Rotterdam Lloyd	550-0	70-0	44-0
16,975	Asama Maru (M.)	19	1928	Jap.	Nippon Yusen Kaisha	560-0	72-0	42-5
16,975	Tatsuta Maru (M.)	19	1929	Jap.	Nippon Yusen Kaisha	560-0	72-0	42-5
16,970	Cleveland (T. & R.)	15½	1908	Ger.	Hamburg-Amerika Line	588-9	65-3	46-7
16,966	Kosmos II.	—	1931	Nor.	Hvalf. "Kosmos II" A/S.	553-4	77-2	37-6
16,923	Transylvania (T.)	15½	1925	Br.	Anchor Line	552-4	70-3	30-3
16,909	Empress of Asia (T.)	20	1913	Br.	Canadian Pacific	570-1	68-2	42-0
16,810	Empress of Russia (T.)	20	1913	Br.	Canadian Pacific	570-2	68-2	42-0
16,792	California (T.)	15½	1923	Br.	Anchor Line	553-0	70-4	38-8
16,774	Felix Roussel (M.)	15	1929	Fr.	Messageries Maritimes	534-8	68-2	46-9
16,738	Ranchi (T. & R.)	18	1925	Br.	P. & O.	548-5	71-3	43-2
16,737	Rangitata (M.)	15	1929	Br.	Federal Steam Nav. Co.	531-0	70-2	31-8
16,732	St. Louis (M.)	16	1928	Ger.	Hamburg-Amerika Line	543-8	72-4	42-1
16,712	Rangitane (M.)	15	1929	Br.	New Zealand Shipping Co.	531-0	70-2	31-8
16,699	Milwaukee (M.)	16	1929	Ger.	Hamburg-Amerika Line	546-6	72-4	42-2
16,698	Rangitiki (M.)	15	1929	Br.	New Zealand Shipping Co.	531-0	70-2	38-1
16,697	Itawalpindi	17	1925	Br.	P. & O.	547-7	71-3	43-4
16,688	Ranpura	17	1925	Br.	P. & O.	548-3	71-3	43-2
16,644	Rajputana	17	1926	Br.	P. & O.	547-7	71-3	43-4
16,596	Mongolia (T.)	16	1923	Br.	P. & O.	551-6	72-0	38-5
16,572	Narkunda	17½	1920	Br.	P. & O.	581-4	69-4	27-7
16,556	Moldavia (T.)	16	1922	Br.	P. & O.	552-4	71-7	38-4
16,500	Westernland (T. & R.)	16	1918	Br.	F. Leyland & Co.	575-3	67-8	41-2
16,484	Doric (T.)	16	1923	Br.	White Star Line	575-5	67-9	41-2
16,436	C. O. Stillman (M.)	—	1928	Br.	International Petroleum Co.	565-7	75-6	44-5
16,418	Montcalm (T.)	17	1921	Br.	Canadian Pacific	549-5	70-2	40-2
16,402	Montrose (T.)	17	1922	Br.	Canadian Pacific	548-7	70-2	40-3
16,322	Penland (T. & R.)	16	1922	Br.	F. Leyland & Co.	575-4	67-8	41-2
16,314	Montclare (T.)	17	1922	Br.	Canadian Pacific	549-5	70-2	40-2
16,297	Cameronia (T.)	15½	1920	Br.	Anchor Line	552-4	70-4	38-8
16,243	Lancastria (T.)	16½	1922	Br.	Cunard Line	552-8	70-4	38-8
16,088	Naldra	17½	1918	Br.	P. & O.	580-9	67-2	44-4
16,063	Calgarie (T. & R.)	15	1918	Br.	White Star Line	550-3	67-3	43-0

† \* See notes on p. 341.

## LARGEST MERCHANT VESSELS OF THE WORLD—continued.

Gross tonnage.	Name.	Speed (knots.)	Date built.	Flag.	Owners.	L.* (ft.)	B.* (ft.)	D.* (ft.)
15,704	Christiaan Huygens (M.)	17	1927	Holl.	Nederland Stoom. Maats.	551.5	68.8	36.2
15,675	President Fillmore	16	1904	U.S.	Dollar S.S. Lines	600.0	65.3	31.1
15,551	Almanzora (T. & R.)	17	1914	Br.	Royal Mail	570.0	67.3	33.3
15,543	President Johnson	16	1904	U.S.	Dollar S.S. Lines	600.0	65.3	31.1
15,507	Orduña (T. & R.)	15	1914	Br.	Pacific Stm. Nav. Co.	550.3	67.3	43.0
15,495	Orbita (T. & R.)	15	1915	Br.	Pacific Stm. Nav. Co.	550.3	67.3	43.0
15,450	Veendam (T.)	15	1923	Holl.	Holland-Amerika Line	550.2	67.3	41.1
15,434	Volendam (T.)	15	1922	Holl.	Holland-Amerika Line	550.2	67.3	32.6
15,396	Chitral (T. & R.)	17	1925	Br.	P. & O.	526.3	70.3	42.8
15,363	Massilia (T. & R.)	20	1920	Fr.	Cie. de Nav. Sud Atlantique	577.1	64.1	37.0
15,357	Svealand (M.)	—	1925	Swed.	Angf. Akt. Tirfing	561.3	72.2	44.1
15,355	Amerikaland (M.)	—	1925	Swed.	Angf. Akt. Tirfing	561.3	72.2	44.1
15,286	Berlin	16½	1925	Ger.	Norddeutscher Lloyd	549.3	69.2	34.8
15,279	Comorin (T. & R.)	17	1925	Br.	P. & O.	523.5	70.2	42.3
15,276	Athos II (T.)	14	1925	Fr.	Messageries Maritimes	543.9	66.2	41.7
15,272	Cathay	16½	1925	Br.	P. & O.	523.5	70.2	42.3
15,186	Minnedosa (T. & R.)	16½	1918	Br.	Canadian Pacific	520.0	67.2	41.8
15,183	Melita (T. & R.)	16½	1918	Br.	Canadian Pacific	520.0	67.2	50.3
15,135	Atlantis (T. & R.)	17	1913	Br.	Royal Mail	570.3	67.3	33.3
15,105	D'Aragnan	14	1924	Br.	Messageries Maritimes	543.5	65.0	41.4
14,982	Ormonde (T.)	17	1917	Fr.	Orient Line	580.5	66.7	40.5
14,947	Akaroa (T. & R.)	15	1914	Br.	Shaw, Savill & Albion	550.7	67.4	44.1
14,878	Megantic	17	1909	Br.	White Star Line	550.4	67.3	41.2
14,825	Chenonceaux (T.)	13	1922	Fr.	Messageries Maritimes	543.4	65.1	41.1
14,783	Lutetia (T. & R.)	20	1913	Fr.	Cie. de Nav. Sud Atlantique	579.0	64.1	36.7
14,694	Arandora Star (T.)	16	1927	Br.	Blue Star Line	512.2	68.3	34.0
14,690	Dresden	15½	1914	Ger.	Norddeutscher Lloyd	550.0	67.3	35.1
14,690	General von Steuben (T. & R.)	16½	1922	Ger.	Norddeutscher Lloyd	526.9	65.0	43.7
14,652	Ulysses	14	1913	Br.	Blue Funnel Line	563.2	68.4	40.2
14,629	Nestor	14	1913	Br.	Blue Funnel Line	563.2	68.4	31.2
14,622	Arlanza (T. & R.)	17	1912	Br.	Royal Mail	570.3	65.3	33.3
14,577	Svend Foyn	—	1931	Nor.	Hvalf. Sydhavet	538.1	74.3	33.4
14,577	Vestfold	—	1931	Nor.	Hvalf. Vestfold	538.1	74.3	33.4
14,457	Taiyo Maru	16	1911	Jap.	Nippon Yusen Kaisha	560.0	65.3	31.2
14,362	Sir James Clark Ross (M)	—	1930	Nor.	Hvalfanger A/S Rosshavet	537.9	74.3	34.4
14,305	Charles G. Black	—	1921	U.S.	Standard Oil Co.	550.3	72.2	43.7
14,304	Carthage (T.)	18	1931	Br.	P. & O.	522.5	71.4	33.1
14,293	Corfu (T.)	18	1931	Br.	P. & O.	522.5	71.4	33.1
14,198	Hobson's Bay (T.)	16	1922	Br.	Aberdeen-Commonwealth	530.6	68.3	39.9
14,187	President Lincoln (T.)	18	1921	U.S.	Dollar S.S. Lines	516.5	72.2	27.8
14,187	President Madison (T.)	18	1921	U.S.	American Mail Line	516.5	72.2	27.8
14,184	Laraz Bay (T.)	16	1921	Br.	Aberdeen-Commonwealth	530.9	68.3	39.9
14,176	Esperance Bay (T.)	16	1922	Br.	Aberdeen-Commonwealth	530.9	68.3	39.9
14,174	President Jefferson (T.)	18	1920	U.S.	American Mail Line	516.5	72.2	27.8
14,164	Jervis Bay (T.)	16	1922	Br.	Aberdeen-Commonwealth	530.6	68.3	39.9
14,157	Highland Patriot (M.)	15	1923	Br.	Royal Mail (Nelson)	523.4	69.4	37.1
14,145	Moreton Bay (T.)	16	1921	Br.	Aberdeen-Commonwealth	530.6	68.3	39.9
14,137	Highland Monarch (M.)	15	1928	Br.	Royal Mail (Nelson)	523.4	69.4	37.1
14,131	Highland Chieftain (M.)	15	1929	Br.	Royal Mail (Nelson)	523.4	69.4	37.1
14,131	Highland Brigade (M.)	15	1929	Br.	Royal Mail (Nelson)	523.4	69.4	37.1
14,128	Highland Princess (M.)	15	1928	Br.	Royal Mail (Nelson)	523.4	69.4	37.1
14,127	President McKinley (T.)	18	1921	U.S.	American Mail Line	516.5	72.2	27.8
14,127	President Wilson (T.)	18	1921	U.S.	Dollar S.S. Lines	516.5	72.2	27.8
14,124	President Jackson (T.)	18	1921	U.S.	American Mail Line	517.0	72.2	27.8
14,123	President Cleveland (T.)	18	1921	U.S.	Dollar S.S. Lines	517.0	72.2	36.8
14,123	President Pierce (T.)	18	1921	U.S.	Dollar S.S. Lines	517.0	72.2	27.8
14,123	President Taft (T.)	18	1921	U.S.	Dollar S.S. Lines	517.0	72.2	27.8
14,119	President Grant (T.)	18	1921	U.S.	American Mail Line	517.0	72.2	27.8
14,075	Oropesa (T.)	15	1920	Br.	Pacific Stm. Nav. Co.	530.0	66.3	41.2
14,054	John D. Archbold	—	1921	U.S.	Standard Oil Co.	570.2	75.1	42.6
14,054	William Rockefeller	—	1921	U.S.	Standard Oil Co.	554.9	75.3	43.0
14,030	Alaunia (T.)	15	1925	Br.	Cunard Line	519.6	65.2	39.0
14,013	Ascania (T.)	15	1925	Br.	Cunard Line	520.0	65.3	39.0
13,984	Aurania (T.)	15	1924	Br.	Cunard Line	519.7	65.3	39.2
13,950	Andania (T.)	15	1922	Br.	Cunard Line	520.2	65.3	39.2
13,912	Ausonia (T.)	15	1921	Br.	Cunard Line	520.0	65.3	39.1
13,882	Monte Rosa (M.)	14½	1930	Ger.	Hamburg Sud-Amerika Line	500.3	65.7	37.8
13,870	Monte Pascoal (M.)	14½	1930	Ger.	Hamburg Sud-Amerika Line	500.3	65.7	37.8
13,869	President Harding (T.)	19	1921	U.S.	United States Lines	516.5	72.2	27.8
13,869	President Roosevelt (T.)	20	1922	U.S.	United States Lines	516.5	72.2	27.8
13,868	Gelria	16½	1913	Holl.	Holland Lloyd	541.1	65.8	35.3
13,867	Antonia (T.)	15	1921	Br.	Cunard Line	519.9	65.3	39.1
13,834	Hektor	13	1899	Nor.	A/S Hektor	550.2	63.3	32.0
13,801	New Sevilla	13	1900	Br.	Sevilla Whaling Co.	550.2	63.3	39.9
13,789	Southern Cross (T.)	18½	1920	U.S.	Munson S.S. Line	516.5	72.2	27.8
13,750	Monte Olivia (M.)	14½	1924	Ger.	Hamburg Sud-Amerika Line	500.6	65.8	37.9
13,736	American Legion (T.)	18½	1920	U.S.	Munson S.S. Line	516.5	72.2	27.8
13,719	Columbie (T.)	15½	1931	Fr.	C.G.T. (French Line)	428.8	69.4	46.2

† \* See notes on p. 341.

## LARGEST MERCHANT VESSELS OF THE WORLD—continued.

Gross tonnage.	Name.	Speed † (knots).	Date built.	Flag.	Owners.	L.* (ft.)	B.* (ft.)	D.* (ft.)
13,712	Pan America (T.) . . .	18½	1921	U.S.	Munson S.S. Line . . .	517-0	72-2	27-8
13,712	Western World (T.) . . .	18½	1921	U.S.	Munson S.S. Line . . .	517-0	72-2	41-0
13,682	André Lebon . . .	14	1913	Fr.	Messageries Maritimes . . .	508-2	61-6	45-8
13,640	Tafelberg . . .	—	1930	Br.	Kerguelen Seal'g & Whal'g Co. . .	508-3	72-5	35-7
13,625	Monte Sarmiento (M.) . . .	14½	1924	Ger.	Hamburg Sud-Amerika Line . . .	500-6	65-8	37-9
13,615	Sierra Salvada (T. & R.) . . .	15	1922	Ger.	Hamburg Sud-Amerika Line . . .	499-5	64-0	38-7
13,589	Sierra Nevada (T. & R.) . . .	15	1921	Ger.	Hamburg Sud-Amerika Line . . .	499-5	64-0	38-7
13,475	Letitia (T.) . . .	15½	1925	Br.	Anchor-Donaldson . . .	525-7	66-4	29-5
13,465	Athenia (T.) . . .	15½	1923	Br.	Anchor-Donaldson . . .	526-3	66-4	38-1
13,415	Niagara (T. & R.) . . .	16	1913	Br.	Canadian Australasian Line . . .	524-7	66-3	34-5
13,401	Tenyo Maru (T.) . . .	16	1908	Jap.	Nippon Yusen Kaisha . . .	558-0	61-9	35-5
13,387	Stuttgart . . .	16	1923	Ger.	Norddeutscher Lloyd . . .	527-0	65-0	34-7
13,361	Balmoral Castle . . .	17	1910	Br.	Union Castle Line . . .	570-0	64-5	38-9
13,330	Edinburgh Castle . . .	17	1910	Br.	Union Castle Line . . .	570-2	64-7	38-7
13,248	Voltaire . . .	14½	1923	Br.	Lampot & Holt . . .	510-6	64-3	39-3
13,247	Juvenal . . .	—	1928	Arg.	Cia. Gen. de Combustibles . . .	556-0	74-1	40-3
13,246	C. A. Larsen . . .	—	1913	Nor.	Hvalfanger A/S. Rosshavet . . .	527-2	60-6	33-9
13,233	Vandyck (T.) . . .	14½	1921	Br.	Lampot & Holt . . .	510-6	64-3	39-3
13,156	Stavangerfjord . . .	16½	1918	Nor.	Norske-Amerika Line . . .	532-5	64-2	29-3
13,072	Baradine (T. & R.) . . .	15½	1921	Br.	P. & O. . .	519-9	64-4	37-8
13,068	Victoria (M.) . . .	—	1931	Ital.	Lloyd Triestino . . .	540-6	69-9	30-9
13,062	Barrabool (T. & R.) . . .	15½	1922	Br.	P. & O. . .	519-9	64-4	37-8
13,056	San Fernando (T.) . . .	—	1919	Br.	Eagle Oil Transport Co. . .	530-4	69-4	42-2
13,037	San Felix (T.) . . .	11	1921	Br.	Eagle Oil Transport Co. . .	530-4	69-4	42-2
13,031	San Fabian (T.) . . .	11	1922	Br.	Eagle Oil Transport Co. . .	530-5	69-4	42-0
13,026	Shinyo Maru (T.) . . .	16	1911	Jap.	Nippon Yusen Kaisha . . .	558-0	61-9	35-5
13,000	Marechal Joffre (M.) . . .	—	1931	Fr.	Messageries Maritimes . . .	463-0	61-7	40-5
12,996	Ballararat (T. & R.) . . .	15½	1921	Br.	P. & O. . .	519-8	64-2	37-8
12,995	Ausonia (T.) . . .	21	1928	Ital.	Lloyd Triestino . . .	517-3	66-4	39-2
12,990	Balranald (T. & R.) . . .	15½	1922	Br.	P. & O. . .	519-8	64-2	29-8
12,975	Kenilworth Castle . . .	17	1904	Br.	Union Castle Line . . .	570-2	64-7	38-7
12,973	Armada Castle . . .	17	1903	Br.	Union Castle Line . . .	570-1	64-5	39-0
12,972	Bendigo (T. & R.) . . .	15½	1922	Br.	P. & O. . .	519-8	64-2	37-8
12,951	California (T.) . . .	14	1920	Ital.	Nav. Libera Triestina . . .	523-1	64-0	43-9
12,915	San Gerardo (T.) . . .	1	1922	Br.	Eagle Oil Transport Co. . .	530-2	68-5	42-1
12,910	San Gaspar (T.) . . .	1	1921	Br.	Eagle Oil Transport Co. . .	530-2	68-5	42-1
12,872	Avila Star (T.) . . .	16	1927	Br.	Blue Star Line . . .	510-2	68-2	33-9
12,858	Avelona Star (T.) . . .	16	1927	Br.	Blue Star Line . . .	510-2	68-2	33-9
12,848	Almeda Star (T.) . . .	16	1926	Br.	Blue Star Line . . .	512-2	68-3	34-0
12,846	Andalucia Star (T.) . . .	16	1927	Br.	Blue Star Line . . .	512-2	68-3	34-0
12,842	San Florentino (T.) . . .	—	1919	Br.	Eagle Oil Transport Co. . .	530-4	68-6	42-0
12,692	Porthos . . .	13½	1914	Fr.	Messageries Maritimes . . .	510-8	61-6	42-1
12,678	Rochambeau (T. & R.) . . .	15	1911	Fr.	C.G.T. (French Line) . . .	559-4	63-7	43-8
12,642	City of Los Angeles (T.) . . .	16	1899	U.S.	Los Angeles S.S. Co. . .	560-6	62-3	35-9
12,639	Vikings . . .	—	1929	Br.	Viking Whaling Co. . .	493-0	71-1	34-2
12,510	Gulfpriide (M.) . . .	—	1927	U.S.	Gulf Refining Co. . .	525-0	74-3	31-6
12,432	F. J. Wolfe (M.) . . .	—	1932	Danzig	Baltisch-Amer. Petrol. Import . . .	521-4	70-3	38-6
12,425	R. L. Hague (M.) . . .	—	1932	Danzig	Baltisch-Amer. Petrol. Import . . .	522-0	70-2	38-7
12,425	Franz Klasen (M.) . . .	—	1932	Danzig	Baltisch-Amer. Petrol. Import . . .	521-4	70-4	38-7
12,420	Metagama . . .	16	1915	Br.	Canadian Pacific . . .	500-4	64-2	37-9
12,420	Orville Harden (M.) . . .	—	1932	Danzig	Deutsch-Amer. Petrol. Import . . .	520-0	—	—
12,385	Saxon . . .	17	1900	Br.	Union Castle Line . . .	570-5	64-4	38-6
12,358	Skytteren . . .	13	1901	Nor.	A/S. Skytteren . . .	550-2	63-3	39-9
12,354	Tamaroa (T.) . . .	15	1922	Br.	Aberdeen Line . . .	500-4	63-2	39-6
12,353	Southern Empress . . .	11	1914	Br.	Southern Whaling & Sealing Co. . .	525-5	66-5	33-9
12,352	Ionic . . .	13	1902	Br.	White Star Line . . .	500-3	63-3	45-0
12,333	Mataroa (T.) . . .	15	1922	Br.	Aberdeen Line . . .	500-4	63-2	39-6
12,326	Sultan Star (T.) . . .	16	1930	Br.	Blue Star Line . . .	486-1	70-2	36-6
12,323	J. A. Mowinkel (M.) . . .	12	1930	Danzig	Baltisch-Amer. Petrol. Import . . .	521-8	70-4	38-8
12,286	San Melito . . .	—	1914	Br.	Eagle Oil Transport Co. . .	530-0	66-5	33-5
12,279	Solglint . . .	15½	1900	Nor.	Hvalfangerselsk. Atlas A/S. . .	547-1	62-1	34-6
12,275	Cabo San Antonio (M.) . . .	—	1930	Sp.	Ybarra & Co. . .	482-5	63-4	33-4
12,272	Gange . . .	18	1912	Ital.	Lloyd Triestino . . .	477-5	60-2	43-2
12,263	Champollion . . .	15	1924	Fr.	Messageries Maritimes . . .	495-1	62-7	40-5
12,257	Oroya (T.) . . .	14	1923	Br.	Pacific Steam Nav. Co. . .	525-3	62-8	32-1
12,239	Mariette Pacha . . .	15	1925	Fr.	Messageries Maritimes . . .	508-5	62-6	43-6
12,231	Thorshammer . . .	11	1914	Nor.	Bryde & Dahls Hvalf. A/S. . .	525-5	66-5	41-4
12,224	Ole Wegger . . .	11	1914	Nor.	A. S. Ornen . . .	527-1	66-6	42-1
12,220	Mexique (T. & R.) . . .	16	1915	Fr.	C.G.T. (French Line) . . .	546-7	64-0	34-8
12,200	D. L. Harper (M.) . . .	—	1932	Danzig	Baltisch-Amer. Petrol. Import . . .	519-8	70-0	38-7
12,200	Geo. W. McKnight (M.) . . .	—	1932	Danzig	Baltisch-Amer. Petrol. Import . . .	519-8	70-0	38-5
12,185	J. H. Senior (M.) . . .	12	1931	Danzig	Baltisch-Amer. Petrol. Import . . .	521-2	70-3	38-9
12,175	Heinrich v. Riedemann (M.) . . .	12	1930	Danzig	Baltisch-Amer. Petrol. Import . . .	521-1	70-2	38-8
12,112	Rotorua . . .	15	1911	Br.	Federal Steam Nav. Co. . .	526-4	61-4	33-3
12,092	Southern Princess . . .	—	1915	Br.	Southern Whaling & Sealing Co. . .	530-0	66-6	33-5
12,076	Cadillac . . .	10½	1917	Br.	Anglo-American Oil Co. . .	530-2	66-3	33-8
12,074	Saranac . . .	10½	1918	Br.	Anglo-American Oil Co. . .	530-5	66-3	42-7
12,067	Pelagos . . .	13	1901	Nor.	Hvalfangerselsk. Pelagos A/S. . .	500-3	63-8	46-0
12,043	Peter Hurl (M.) . . .	12	1930	Danzig	Baltisch-Amer. Petrol. Import . . .	521-2	70-2	38-7

† \* See notes on p. 341.

## LARGEST MERCHANT VESSELS OF THE WORLD—continued.

Gross tonnage.	Name.	Speed † (knots).	Date built.	Flag.	Owners.	L.* (ft.)	B.* (ft.)	D.* (ft.)
12,041	Orsova . . . . .	17	1909	Br.	Orient Line	536.2	63.3	34.3
12,040	Sibajak (M.) . . . . .	16½	1927	Holl.	Rotterdam Lloyd . . . . .	506.6	62.7	35.2
12,015	Arcadian . . . . .	16½	1908	Br.	Royal Mail . . . . .	520.3	62.3	31.8
12,003	Colombo . . . . .	16	1917	Ital.	Italia Line . . . . .	518.0	64.0	24.2
12,000	Caribia (M.) . . . . .	—	1932	Ger.	Hamburg-Amerika Line . . . . .	494.0	65.6	27.9
11,999	Athelcrown (M.) . . . . .	—	1929	Br.	United Molasses Co. . . . .	526.5	68.8	38.9
11,996	Providence . . . . .	15	1915	Fr.	Cie. Fr. de N. (Cyp. Fabre) . . . . .	511.8	59.7	43.5
11,952	F. H. Bedford, Jr. (M.) . . . . .	12	1930	Danzig	Baltisch-Amer. Petrol. Import . . . . .	521.4	70.2	38.7
11,951	Liangbby Castle (M.) . . . . .	16½	1929	Br.	Union Castle Line . . . . .	496.0	66.2	27.8
11,941	Calgorolite (M.) . . . . .	—	1928	Br.	Imperial Oil . . . . .	522.0	70.3	38.7
11,938	Salvestria . . . . .	12	1913	Br.	South Georgia Co. . . . .	500.3	62.4	34.6
11,930	Terukuni Maru (M.) . . . . .	16½	1930	Jap.	Nippon Yusen Kaisha . . . . .	507.0	64.0	37.0
11,930	Yasukuni Maru (M.) . . . . .	16½	1930	Jap.	Nippon Yusen Kaisha . . . . .	505.0	64.0	37.0
11,885	Patria . . . . .	15	1913	Fr.	Cie. Fr. de N. (Cyp. Fabre) . . . . .	487.2	59.2	40.1
11,884	Stuart Star (T.) . . . . .	15	1926	Br.	Blue Star Line . . . . .	475.8	67.3	36.6
11,864	Cabo San Agustín (M.) . . . . .	—	1931	Sp.	Ybarra & Co. . . . .	482.5	63.4	33.4
11,868	Cabo Santo Tome (M.) . . . . .	—	1931	Sp.	Ybarra & Co. . . . .	482.5	63.4	33.4
11,867	Afric Star (T.) . . . . .	15	1926	Br.	Blue Star Line . . . . .	475.8	67.3	36.6
11,850	Frederik VIII. . . . .	17	1913	Dan.	Forenede Damps. S. . . . .	523.5	62.3	38.3
11,814	Korea Maru . . . . .	16	1901	Jap.	Nippon Yusen Kaisha . . . . .	551.7	63.2	40.8
11,814	Siberia Maru . . . . .	16	1901	Jap.	Nippon Yusen Kaisha . . . . .	551.7	63.2	21.8
11,803	Rodney Star (T.) . . . . .	15	1927	Br.	Blue Star Line . . . . .	476.9	67.3	36.6
11,753	W. S. Farish (T.) . . . . .	—	1930	U.S.	Standard Shipping Co. . . . .	525.0	74.3	40.5
11,752	G. Harrison Smith (T.) . . . . .	—	1930	U.S.	Standard Shipping Co. . . . .	525.0	74.3	40.5
11,718	Virgilio (M.) . . . . .	15	1927	Ital.	Italia Line . . . . .	482.2	61.9	33.4
11,669	Orazio (M.) . . . . .	15	1927	Ital.	Italia Line . . . . .	482.2	61.9	33.4
11,636	Slamat (T.) . . . . .	17	1923	Holl.	Rotterdam Lloyd . . . . .	482.5	62.0	35.0
11,628	Australia (M.) . . . . .	—	1928	U.S.	Texas S.S. Co. . . . .	509.7	60.2	39.9
11,622	Hikawa Maru (M.) . . . . .	17	1930	Jap.	Nippon Yusen Kaisha . . . . .	510.0	66.0	41.0
11,621	Hiye Maru (M.) . . . . .	17	1930	Jap.	Nippon Yusen Kaisha . . . . .	512.6	66.0	41.0
11,616	Heian Maru (M.) . . . . .	17	1930	Jap.	Nippon Yusen Kaisha . . . . .	511.6	66.0	41.0
11,590	General Osorio (M.) . . . . .	15	1928	Ger.	Hamburg-Amerika Line . . . . .	498.5	66.0	32.8
11,580	Orcoma . . . . .	15	1908	Br.	Pacific Stm. Nav. Co. . . . .	511.6	62.2	29.1
11,555	Northumberland (T.) . . . . .	15	1915	Br.	Federal Stm. Nav. Co. . . . .	530.5	63.0	31.9
11,520	Morro Castle (T.E.) . . . . .	20	1930	U.S.	Atlantic, Gulf & W. Indies Lines . . . . .	508.0	70.9	39.0
11,520	Oriente (T.E.) . . . . .	20	1930	U.S.	Atlantic, Gulf & W. Indies Lines . . . . .	508.0	70.9	39.0
11,518	Kaisar-i-Hind . . . . .	17	1914	Br.	P. & O. . . . .	520.0	61.2	33.1
11,493	Darro . . . . .	13½	1912	Br.	Royal Mail . . . . .	500.7	62.3	40.2
11,475	Desado . . . . .	13½	1912	Br.	Royal Mail . . . . .	500.7	62.3	40.2
11,469	Sierra Cordoba . . . . .	14½	1923	Ger.	Norddeutscher Lloyd . . . . .	490.5	61.8	34.3
11,466	Demerara . . . . .	13½	1912	Br.	Royal Mail . . . . .	500.7	62.3	40.2
11,466	Desna . . . . .	13½	1912	Br.	Royal Mail . . . . .	500.7	62.3	40.2
11,453	Worcestershire (M.) . . . . .	15½	1931	Br.	Bibby Line . . . . .	483.0	64.2	32.0
11,449	Tuscan Star (M.) . . . . .	16	1930	Br.	Blue Star Line . . . . .	471.0	68.3	35.1
11,439	Transbalt . . . . .	12	1899	Russ.	Soviet Mercantile Fleet . . . . .	501.1	62.2	46.3
11,431	Philoctetes (T.) . . . . .	14	1922	Br.	Blue Funnel Line . . . . .	511.9	63.2	41.1
11,430	Sierra Morena . . . . .	14½	1924	Ger.	Norddeutscher Lloyd . . . . .	490.5	61.8	34.3
11,414	Jean Laborde (M.) . . . . .	15	1930	Fr.	Messageries Maritimes . . . . .	463.6	61.8	28.3
11,410	Victrolite (M.) . . . . .	—	1928	Br.	Imperial Oil . . . . .	510.2	68.2	38.0
11,405	Esperia (T.) . . . . .	21	1918	Ital.	Lloyd Trestino . . . . .	492.1	61.7	34.1
11,404	Vancollite (M.) . . . . .	—	1928	Br.	Imperial Oil . . . . .	510.2	68.2	38.0
11,404	Achilles (T.) . . . . .	14	1920	Br.	Blue Funnel Line . . . . .	507.4	63.2	41.1
11,395	Harry G. Seidel (M.) . . . . .	—	1930	Danzig	Baltisch-Amer. Petrol. Import . . . . .	513.2	68.1	39.4
11,392	Sierra Ventana . . . . .	14½	1923	Ger.	Norddeutscher Lloyd . . . . .	490.5	61.8	34.3
11,383	Remuera . . . . .	14	1911	Br.	New Zealand Shipping Co. . . . .	485.0	62.3	41.0
11,375	Sphinx . . . . .	14	1914	Fr.	Messageries Maritimes . . . . .	478.0	60.7	40.6
11,347	Tyndareus . . . . .	13½	1916	Br.	Blue Funnel Line . . . . .	507.0	63.2	41.6
11,337	Cuba (T.) . . . . .	15½	1923	Fr.	C.G.T. (French Line) . . . . .	476.0	62.3	35.1
11,321	Sarpedon (T.) . . . . .	15	1923	Br.	Blue Funnel Line . . . . .	499.0	62.3	34.9
11,314	Patroclus (T.) . . . . .	15	1923	Br.	Blue Funnel Line . . . . .	498.8	62.3	26.4
11,309	Montrolite (M.) . . . . .	—	1926	Br.	Imperial Oil . . . . .	510.9	68.2	37.9
11,309	Canadollite (M.) . . . . .	—	1926	Br.	Imperial Oil . . . . .	510.0	68.0	38.0
11,299	Llanstephan Castle . . . . .	14	1914	Br.	Union Castle Line . . . . .	500.5	63.3	37.2
11,256	Leopoldville . . . . .	14	1929	Belg.	Lloyd Royal Belge . . . . .	478.8	62.2	35.0
11,254	General Artigas (T.) . . . . .	13½	1923	Ger.	Hamburg-Amerika Line . . . . .	473.6	60.7	41.9
11,251	General San Martín (T.) . . . . .	13½	1922	Ger.	Hamburg-Amerika Line . . . . .	473.6	60.7	41.9
11,246	California Standard (M.) . . . . .	—	1929	U.S.	Standard Oil Co. of California . . . . .	513.5	68.1	39.5
11,245	Horonta . . . . .	14	1914	Br.	New Zealand Shipping Co. . . . .	511.1	64.2	32.0
11,231	Themistocles . . . . .	15	1911	Br.	Aberdeen Line . . . . .	500.6	62.3	39.4
11,220	Beltana . . . . .	—	1912	Jap.	Toyo Hogei K.K. . . . .	500.1	62.2	37.8
11,202	Berrima . . . . .	—	1913	—	—	500.1	62.2	37.8
11,198	Hector (T.) . . . . .	15	1924	Br.	Blue Funnel Line . . . . .	498.8	62.3	26.4
11,174	Antenor (T.) . . . . .	15	1925	Br.	Blue Funnel Line . . . . .	497.7	62.2	35.0
11,155	Espagne . . . . .	15½	1909	Fr.	C.G.T. (French Line) . . . . .	537.8	60.8	39.0
11,140	Jan Pieterszoon Coen . . . . .	15	1915	Holl.	Nederland Stoom. Maats. . . . .	503.5	60.6	35.8
11,103	Edison . . . . .	13	1896	Gr.	National Stm. Nav. Co. of Greece . . . . .	523.1	60.1	34.9

† \* See notes on p. 341.

## LARGEST MERCHANT VESSELS OF THE WORLD—continued.

Gross tonnage.	Name.	Speed † (knots).	Date built.	Flag.	Owners.	L.* (ft.)	B.* (ft.)	D.* (ft.)
11,081	Achilles	—	1915	U.S.	Panama Canal	514-0	65-2	36-5
11,060	Nieuw Zeeland (T.)	15	1928	Holl.	Koninkl. Paketv. Maats.	540-0	62-5	33-4
11,057	Nieuw Holland (T.)	15	1927	Holl.	Koninkl. Paketv. Maats.	540-5	62-7	32-3
11,055	Drottningholm (T.)	16½	1905	Swed.	Svenska-Amerika Line	517-0	60-0	38-0
11,028	Foucauld	14	1922	Fr.	Chargeurs Réunis	483-4	58-9	34-9
11,015	Bergensfjord (T. & R.)	16½	1913	Nor.	Norske-Amerika Line	512-4	61-2	29-4
10,986	Malwa	16	1908	Br.	P. & O.	540-0	61-3	24-6
10,948	Norfolk (T. & R.)	14	1918	Br.	Federal Stm. Nav. Co.	520-7	64-2	38-1
10,946	Huntingdon (T. & R.)	14	1920	Br.	Federal Stm. Nav. Co.	520-7	64-2	38-1
10,946	Mantua	16	1909	Br.	P. & O.	540-0	61-3	24-6
10,940	Cornwall (T.)	14	1920	Br.	Federal Stm. Nav. Co.	495-1	63-1	40-3
10,938	Cumberland (T. & R.)	14	1919	Br.	Federal Stm. Nav. Co.	520-0	64-2	29-0
10,936	Fushimi Maru	14½	1914	Jap.	Nippon Yusen Kaisha	513-0	63-5	37-5
10,926	Eastern Prince (M.)	18	1929	Br.	Prince Line	496-2	64-8	35-4
10,926	Western Prince (M.)	18	1929	Br.	Prince Line	496-2	64-8	35-4
10,923	Hertford (T. & R.)	14	1917	Br.	Federal Stm. Nav. Co.	520-7	64-2	38-1
10,917	Northern Prince (M.)	18	1929	Br.	Prince Line	496-2	64-9	25-9
10,917	Southern Prince (M.)	18	1929	Br.	Prince Line	496-2	64-9	25-9
10,902	City of Paris (T.)	14½	1922	Br.	City Line	484-7	59-3	32-6
10,893	Chief Capilano	13	1920	Br.	Canadian-American Nav. Co.	523-5	65-7	37-5
10,870	Ruahine	14	1909	Br.	New Zealand Shipping Co.	480-6	60-3	32-1
10,852	Monowai (T. & R.)	20	1925	Br.	Union Royal Mail Line	500-4	63-2	34-0
10,846	Cambridge	14	1916	Br.	Federal Stm. Nav. Co.	524-5	65-7	37-3
10,836	Tjibesar (T.)	12	1922	Holl.	Java-China-Japan Line	500-1	63-7	39-2
10,833	Cristobal Colon (T.)	17	1922	Sp.	Cia. Trasatlantica	499-4	61-0	32-3
10,829	F. H. Hillman	—	1921	U.S.	Standard Oil Co. of California	500-0	68-2	30-0
10,826	Karlsruhe	15½	1900	Ger.	Norddeutscher Lloyd	523-5	60-2	34-7
10,816	Campana (T.)	15	1929	Fr.	Soc. Gen. de Transport Mar. & Vap.	510-6	67-0	32-1
10,804	Ulysses	—	1915	U.S.	American Tankers Corp.	514-0	65-2	36-5
10,786	Llandaff Castle	14½	1926	Br.	Union Castle Line	471-1	61-7	39-0
10,782	Colombia (M.)	15	1930	Holl.	Koninkl. Nederlandsche S.M.	429-5	61-7	36-0
10,769	Albertville	14	1928	Belg.	Lloyd Royal Belge	494-1	62-0	24-0
10,746	Indrapoera (M.)	15½	1925	Holl.	Rotterdam Lloyd	479-5	60-2	35-1
10,725	Andrea F. Luckenbach (T.)	13	1919	U.S.	Luckenbach S.S. Co.	496-0	68-2	37-2
10,672	Suwa Maru	14½	1914	Jap.	Nippon Yusen Kaisha	516-0	62-6	34-9
10,662	Lewis Luckenbach (T.)	13	1919	U.S.	Luckenbach S.S. Co.	496-0	68-0	40-0
10,654	Staffordshire (M.)	15½	1928	Br.	Bibby Line	483-6	62-3	32-0
10,609	Llandoverly Castle	14½	1925	Br.	Union Castle Line	471-1	61-7	39-0
10,583	Napier Star (T.)	15	1927	Br.	Blue Star Line	470-0	67-3	36-6
10,560	Shropshire (M.)	15½	1926	Br.	Bibby Line	483-6	60-3	31-8
10,560	Cheshire (M.)	15½	1927	Br.	Bibby Line	483-6	60-3	31-8
10,551	Habana (T.)	17	1921	Sp.	Cia. Trasatlantica	480-0	61-0	32-3
10,533	President Hayes	14	1920	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,533	President Monroe	14	1920	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,533	President Van Buren	14	1920	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,517	Danmark (M.)	—	1931	Dan.	A/S. Dampsk. "Myren"	489-5	67-5	37-7
10,516	President Adams	14	1921	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,504	President Harrison	14	1921	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,502	Guadeloupe	13½	1908	Fr.	C.G.T. (French Line)	508-4	57-8	39-5
10,500	President Polk	14	1921	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,500	Santa Rosa (T.)	—	1932	U.S.	Panama Mail S.S. Co.	484-0	—	—
10,500	Santa Lucia (T.)	—	1932	U.S.	Grace S.S. Co.	484-0	—	—
10,500	Santa Paula (T.)	—	1932	U.S.	Panama Mail S.S. Co.	484-0	—	—
10,495	President Garfield	14	1921	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,489	Lemoine	—	1926	Br.	Canada S.S. Line	621-1	70-2	25-4
10,441	Doric Star (T.)	12	1921	Br.	Blue Star Line	499-8	64-0	37-0
10,421	Haruna Maru (T.)	15½	1922	Jap.	Nippon Yusen Kaisha	495-0	62-0	37-0
10,420	Hakone Maru (T.)	15½	1921	Jap.	Nippon Yusen Kaisha	495-0	62-0	37-0
10,413	Hakozaki Maru (T.)	15½	1922	Jap.	Nippon Yusen Kaisha	495-0	62-0	37-0
10,409	Pan Gothia (M.)	—	1931	Swed.	Rederi. Oil Transport	—	—	—
10,388	California	—	1921	U.S.	Texas S.S. Co.	500-0	68-2	29-3
10,388	Beacon	—	1921	U.S.	Standard Shipping Co.	500-0	68-2	29-3
10,380	Hakusan Maru (T.)	15½	1923	Jap.	Nippon Yusen Kaisha	495-0	62-0	37-0
10,374	Diomed (T.)	14	1922	Br.	Blue Funnel Line	491-0	62-4	31-1
10,355	Johan de Witt	15	1920	Holl.	Nederland Stoom. Maats.	482-2	59-2	34-8
10,353	Wilhelm A. Riedemann (M.)	—	1920	Danzig	Baltisch-Amer. Petrol. Import	525-7	66-5	33-5
10,348	Uruguay (T. & R.)	17	1913	Sp.	Cia. Trasatlantica	481-9	61-3	32-7
10,305	Calchas (T.)	14	1921	Br.	Blue Funnel Line	490-8	62-4	39-6
10,286	Perseus (T.)	14	1923	Br.	Blue Funnel Line	490-5	62-3	39-6
10,283	Menelaus (T.)	14	1923	Br.	Blue Funnel Line	495-5	62-3	39-6
10,268	Explorateur Granddider	13	1924	Fr.	Messageries Maritimes	455-8	60-7	41-1
10,236	Clan Urquart	14	1911	Br.	Clan Line	526-2	61-4	33-3
10,229	Ixion	12½	1912	Br.	Blue Funnel Line	506-0	60-3	39-5
10,227	Tamihana	—	1921	U.S.	Southern Pacific S.S. Lines	500-0	71-2	31-2
10,224	Talithybius	13	1912	Br.	Blue Funnel Line	506-0	60-3	39-5
10,224	Europa (M.)	15	1931	Dan.	East Asiatic Co.	465-4	62-2	37-2
10,220	Delftdijk (M.)	15	1929	Holl.	Holland-Amerika Line	490-9	64-7	34-1
10,208	Gulfbird (M.)	—	1928	U.S.	Gulf Refining Co.	511-7	69-5	36-7

† \* See notes on p. 341.

## LARGEST MERCHANT VESSELS OF THE WORLD—continued.

Gross tonnage.	Name.	Speed † (knots).	Date built.	Flag.	Owners.	L.* (ft.)	B.* (ft.)	D.* (ft.)
10,208	Gulfhawk (M.) . . . . .	—	1928	U.S.	Gulf Refining Co. . . . .	511.7	69.5	36.7
10,208	Gulfwing (M.) . . . . .	—	1928	U.S.	Gulf Refining Co. . . . .	511.7	69.5	36.7
10,196	Kraljica Marija . . . . .	16½	1906	Jugosl.	Jugoslavenski Lloyd . . . .	515.2	61.3	30.5
10,193	Brazza (M.) . . . . .	13½	1923	Fr.	Chargeurs Réunis . . . . .	453.1	59.1	36.1
10,191	Gretafeld . . . . .	—	1928	Br.	N. Petroleum Tank S.S. Co.	500.2	67.0	36.0
10,184	Yorkshire (T.) . . . . .	15	1920	Br.	Bibby Line . . . . .	482.4	58.3	40.4
10,171	Flandria (T.) . . . . .	14½	1922	Holl.	Holland Lloyd . . . . .	450.1	59.2	41.7
10,155	Damsterdijk (M.) . . . .	15	1930	Holl.	Holland-Amerika Line . . .	490.9	64.7	34.1
10,137	Argentina (T. & R.) . . .	17	1913	Sp.	Cia. Trasatlantica . . . . .	480.0	61.8	40.7
10,136	City of Nagpur . . . . .	14	1922	Br.	City Line . . . . .	469.9	59.3	40.0
10,123	Kerguelen (T.) . . . . .	13½	1922	Fr.	Chargeurs Réunis . . . . .	484.2	59.3	35.0
10,123	Jamaïque (T.) . . . . .	13½	1922	Fr.	Chargeurs Réunis . . . . .	484.2	59.3	27.2
10,107	Amerika (M.) . . . . .	15	1930	Dan.	East Asiatic Co. . . . .	465.4	62.2	37.2
10,107	Opawa (M.) . . . . .	16	1931	Br.	N.Z. Shipping Co. . . . .	471.0	67.3	36.8
10,107	Orari (M.) . . . . .	16	1931	Br.	N.Z. Shipping Co. . . . .	471.0	67.3	36.8
10,107	Sourabaya . . . . .	12	1915	Br.	South Georgia Co. . . . .	470.2	58.3	32.2
10,086	Bernardin de Saint Pierre (T.)	13	1925	Fr.	Messageries Maritimes . . .	455.8	60.8	41.0
10,078	Arctic Queen . . . . .	12	1909	Br.	Hellyer Bros. . . . .	486.0	59.3	27.4
10,061	Commissaire Ramel (T. & R.)	12½	1920	Fr.	Messageries Maritimes . . .	478.8	59.2	33.4
10,058	Aeneas . . . . .	13½	1910	Br.	Blue Funnel Line . . . . .	493.0	60.4	28.6
10,056	General Belgrano . . . . .	12½	1913	Ger.	Akt. Ges. für Seeschifffahrt	491.6	59.1	35.6
10,051	Koll (M.) . . . . .	—	1930	Nor.	Odd Bergs Tankrederi . . .	487.4	60.0	37.3
10,048	Ascanius . . . . .	13½	1910	Br.	Blue Funnel Line . . . . .	493.0	60.4	28.6
10,048	Otalo (M.) . . . . .	16	1930	Br.	N.Z. Shipping Co. . . . .	472.2	67.2	35.7
10,042	Beaverford (T.) . . . . .	15½	1928	Br.	Canadian Pacific . . . . .	503.0	61.8	37.6
10,041	Beaverhill (T.) . . . . .	15½	1928	Br.	Canadian Pacific . . . . .	503.0	61.8	37.6
10,028	Carl D. Bradley (T.E.) . . .	—	1927	U.S.	Bradley Transportation Co.	623.2	65.2	30.2
10,012	Oscar II. . . . .	15½	1901	Dan.	Forenede Damps. S. . . . .	500.8	58.3	37.6
10,006	Tilawa . . . . .	12	1924	Br.	British India S.N. Co. . . .	451.0	59.3	36.8
10,002	Dunbar Castle (M.) . . . .	14½	1930	Br.	Union Castle Line . . . . .	471.2	61.2	29.6
10,000	Anchises . . . . .	13½	1911	Br.	Blue Funnel Line . . . . .	493.0	60.4	28.6
10,000	Talma . . . . .	12	1923	Br.	British India S. N. Co. . . .	451.0	59.3	36.8
10,000	Achilmota (M.) . . . . .	—	1930	Br.	Elder Dempster . . . . .	460.0	63.8	31.3

† \* See notes on p. 341.

## NUMBERS OF VESSELS CLASSED BY VARIOUS CLASSIFICATION SOCIETIES.\*

Society.	1913.	1919.	1923.	1925.	1928.	1931.	1932.
Lloyd's Register . . . . .	10,466	9175	10,296	9973	10,077	10,710	10,575
British Corporation . . . . .	876	1002	1306	1253	1417	1626	1602
American Bureau of Shipping { Record of American and Foreign Shipping . . . . .	846	926	2392	2131	1928	1904	1863
Shipping { Gt. Lakes Register . . . . .	572	442	416	383	383	358	359
Bureau Veritas . . . . .	5165	5706	4998	5135	5097	5277	5113
Norske Veritas . . . . .	1504	955	1242	1220	1307	1398	1399
Registro Italiano . . . . .	1442	699	1872	1826	1693	2117	2243
Germanischer Lloyd . . . . .	2848	†	2799	2855	2914	3010	3034

\* Many vessels, of course, are not exclusively classed in one Register.

† No data available.



## GENERAL PARTICULARS OF LARGE SHIPS OF VARIOUS NATIONALITIES.

Name of Ship	AQUITANIA.	MAURETANIA.	LEVIATHAN.	BERENGARIA.	MAJESTIC.	BREMEN.
Builders	J. Brown & Co., Ltd., Clydebank	Swan, Hunter & W. Richardson, Ltd., Wallsend-on-Tyne	Blohm & Voss, Hamburg	Vulcan Co., Hamburg	Blohm & Voss, Hamburg	Akt. Ges. Weser Bremen
Owners or Managers	Cunard Co.	Cunard Co.	United States Lines	Cunard Co.	White Star Line	Norddeutscher Lloyd
Year when built	1914	1907	1914	1912	1921	1929
Length over all	902 ft.	787 ft.	950 ft.	906 ft. 8½ in.	956 ft.	938 ft.
Length between perps. (or moulded)	865 ft.	760 ft.	907 ft.	883 ft. 6 in.	912 ft.	888 ft.
Breadth	97 ft.	88 ft.	100 ft. 3½ in.	98 ft. 3½ in.	100 ft.	101 ft. 8 in.
Depth (moulded)	64 ft. 6 in.	60 ft. 6 in.	63 ft.	63 ft.	64 ft.	45 ft. 6½ in. to D. Deck
Gross Tonnage	45,647	30,696	48,943	52,226	56,621	51,656
Draught	36 ft. 2 in.	36 ft. 2½ in.	38 ft. 6 in.	39 ft.	38 ft. 11½ in.	32 ft.
Displacement (tons)	53,176	41,590	63,100	63,060	64,000	51,830
Number of Passengers—						
First Class	744	524	672 †	813	1000	800
Second Class	623	438	535	702	545	800½
Third Class	1226	796	2392 †	1837	2392	600
Machinery Makers	John Brown & Co., Ltd.	Wallsend Slipway and Engineering Co., Ltd.	Blohm & Voss, Hamburg	Vulcan Co., Hamburg	Blohm & Voss, Hamburg	Akt. Ges. Weser Bremen
Type of Engines	Stm. Turbs. driving 4 Screws	Stm. Turbs. driving 4 Screws	Stm. Turbs. driving 4 Screws	Stm. Turbs. driving 4 Screws	Stm. Turbs. driving 4 Screws	Stm. Turbs. driving 4 Screws
Revs. per Minute	180	180	180-190	180	180	182
Total Shaft H.P.	60,000	75,000	—	76,250	66,000	92,500
No. and Type of Boilers	21 Cylindrical (double ended)	25 Cylindrical (23 double-ended, 2 single-ended)	46 Water Tube	46 Water Tube	48 Water Tube	20 Water Tube (11 double-ended, 9 single-ended)
No. of Furnaces	168 (oil-fired)	192 (oil-fired)	198 (oil fired)	46 (oil-fired)	48 (oil-fired)	9 (oil-fired)
Steam Pressure (lb. persq. in.)	195	195	235	228	260	330
Total Heating Surface (sq. ft.)	188,595	167,590	210,440	208,000	220,000	183,458
Total Grate Area (sq. ft.)	3541	4048	3843	3763	4013	—
System of Draught	Howden's	Howden's	Howden's	Howden's	Forced	Forced
Speed on Service (knots)	23	25.5*	23	23	26	26

\* This figure is the mean speed attained for 27 consecutive runs across the North Atlantic in one year, covering a total distance of 77,500 nautical miles. † 80 Berths for Servants and 110 Pullman Berths in addition. ‡ Including 1642 Fourth Class Passengers.

## FASTEST MERCHANT VESSELS OF THE WORLD.†

Speed (knots).	Name.	Gross Tonnage.	Date built.	Flag.	Owners.	L.* (ft.).	H.* (ft.).	D.* (ft.).
26 and over	Bremen . . . . .	51,656	1929	German	Norddeutscher Lloyd	898·7	101·9	48·2
	Europa . . . . .	49,746	1928	"	"	890·2	102·1	48·0
25 and under 26	Majestic . . . . .	56,621	1921	British	White Star Line	915·6	100·1	58·2
	Leviathan . . . . .	48,943	1914	U.S.	United States Lines	907·6	100·3	58·2
	Mauretania . . . . .	30,696	1907	British	Cunard Line	762·2	88·0	57·1
	Anglia . . . . .	3,460	1920	"	L.M.S. Railway Co.	380·5	45·2	17·2
	Hibernia . . . . .	3,458	1920	"	"	380·6	45·2	17·2
	Cambria . . . . .	3,445	1921	"	"	380·6	45·2	17·2
	Scotia . . . . .	3,441	1921	"	"	380·5	45·2	17·2
24 and under 25	Empress of Britain . . . . .	42,348	1931	British	Canadian Pacific Railway	733·3	97·8	56·0
	Versailles . . . . .	1,903	1919	French	{ French State Railways (Southern Railway Co.)	300·6	36·1	21·4
	Paris . . . . .	1,774	1913	British	Southern Railway Co.	293·5	35·6	15·2
	L'Atlantique† . . . . .	42,512	1930	French	Cie. de Nav. Sud-Atlantique	718·6	92·0	57·6
23 and under 24	Ile de France . . . . .	43,153	1926	French	Cie. Gen. Transatlantique	768·7	92·0	55·9
	Maid of Orleans . . . . .	2,386	1918	British	Southern Railway Co.	341·1	42·1	16·0
	Biarritz . . . . .	2,388	1915	"	"	341·2	42·1	24·0
	Newhaven . . . . .	1,656	1911	French	{ French State Railways (Southern Railway Co.)	292·0	34·6	22·1
	Rouen . . . . .	1,656	1912	"	"	292·0	34·6	22·1
	Worthing . . . . .	2,288	1928	British	Southern Railway	297·7	38·7	15·0
	Berengaria . . . . .	52,226	1912	British	Cunard Line	883·6	98·3	57·1
	Aquitania . . . . .	45,647	1914	"	"	868·7	97·0	49·7
	H. F. Alexander . . . . .	8,357	1915	U.S.	Admiral Line	509·5	63·1	21·0
	Monticello . . . . .	19,361	1902	"	U.S. Shipping Board	684·3	72·3	40·2
	Mount Vernon . . . . .	18,372	1906	"	"	685·4	72·2	40·5
	Lady of Mann . . . . .	3,104	1930	British	Ile of Man Stm. Packet Co.	363·6	50·2	17·4
22 and under 23	Viking . . . . .	1,957	1905	British	Ile of Man Stm. Packet Co.	350·4	42·0	16·1
	Engadine . . . . .	1,786	1911	"	Southern Railway Co.	316·0	41·1	15·8
	Riviera . . . . .	1,675	1911	"	"	316·0	41·1	15·8
	Olympic . . . . .	46,439	1911	"	White Star Line	852·5	92·5	59·5
	Prinses Juliana . . . . .	2,908	1920	Dutch	{ Stoomvaart Maat- schappij "Zeeland"	350·4	42·7	23·9
	Mecklenburg . . . . .	2,907	1922	"	"	350·4	42·7	23·9
	Oranje Nassau . . . . .	2,885	1909	"	"	350·0	42·7	16·4
	Ben-my-Chree . . . . .	2,586	1927	British	Ile of Man Stm. Packet Co.	355·0	46·1	17·4
	Wahine . . . . .	4,436	1913	"	Union S.S. Co. of N.Z.	375·0	52·2	25·6
	Prince David . . . . .	6,892	1930	"	{ Canadian National Railways	366·4	57·1	18·9
	Prince Henry . . . . .	6,893	1930	"	"	366·4	57·1	27·4
	Prince Robert . . . . .	6,892	1930	"	"	366·4	57·1	27·4
	Malolo . . . . .	17,232	1927	U.S.	Matson Navigation Co.	554·0	83·2	30·7
	Mariposa . . . . .	18,017	1931	U.S.	Oceanic S.S. Co.	604·0	79·3	30·5
	Rangatira . . . . .	6,152	1931	British	Union Royal Mail Line	406·1	58·2	25·8
	France . . . . .	23,769	1912	French	Cie. Gen. Transatlantique	690·1	75·6	48·5

\* Registered dimensions; see note on p. 341.

† The speeds used in compiling this table are as given by the owners.

‡ Destroyed by fire on January 5, 1933.

## NUMBERS OF MERCHANT VESSELS OF VARIOUS SPEEDS.†

Speed.	Number.						Speed.	Number.					
	1910.	1922.	1926.	1930.	1931.	1932.		1910.	1922.	1926.	1930.	1931.	1932.
26 knots and over	—	—	—	2	2	2	17 knots	83	88	120	103	108	107
25 " to 26 .	—	8	8	7	7	7	16½ "	45	44	51	43	42	41
24 " 25 .	—	9	6	2	8	4	16 "	126	131	162	181	184	181
23 " 24 .	—	5	9	11	12	12	15½ "	47	35	52	75	77	76
22 " 23 .	—	17	15	16	13	16	15 "	215	185	205	217	255	246
21 " 22 .	—	20	14	31	36	41	14½ "	85	81	100	129	135	141
20 " 21 .	105*	32	42	39	46	89	14 "	276	289	327	335	320	336
19 " 20 .	42	26	28	40	38	38	13½ "	138	170	169	205	222	231
18½ knots .	24	18	20	24	28	27	13 "	462	458	451	488	504	446
18 " .	60	54	50	67	77	82	12½ "	206	153	211	220	229	264
17½ " .	48	36	22	20	19	22	12 "	732	790	918	865	860	855

\* This figure includes all merchant steamers of 20 knots and over in existence in 1910.

† The speeds used in compiling these tables are as given by the owners.

## PARTICULARS OF FAST VOYAGES ON CERTAIN PASSENGER SERVICES.

Name of Vessel.	Owners.	Date of Voyage.	Ports between which Voyage was made.	Distance (Sea miles).	Time taken.	Average speed (Knots).	Best day's run (Knots).	Remarks.
Bremen . .	Norddeutscher Lloyd	July, 1929	Cherbourg to New York *	—	4d. 10h. 43m.	—	—	
"	"	July, 1929	New York to Cherbourg *	3,084	4d. 14h. 30m.	27.91	667	
Europa . .	"	March, 1930	Cherbourg to New York *	3,157	4d. 17h. 6m.	27.91	704	
"	"	May, 1930	New York to Cherbourg *	3,200	4d. 20h. 48m.	27.40	654	
Mauretania .	Cunard Line	Sept., 1910	Liverpool to New York ‡	2,780	4d. 10h. 41m.	26.06	—	* Cherbourg Break-water and Ambrose Channel Light Vessel.
"	"	Aug., 1924	New York to Cherbourg *	3,198	5d. 1h. 49m.	26.25	626	† Ambrose Channel Light Vessel and Eddystone Light-house.
"	"	Aug., 1929	Cherbourg to New York *	3,162	4d. 21h. 44m.	26.85	687	‡ Father Point and Bar Light Vessel.
"	"	Aug., 1929	New York to Plymouth †	3,098	4d. 17h. 50m.	27.22	686	§ Daunts Rock and Sandy Hook Light-ship.
"	"	Aug., 1929	Plymouth to Cherbourg *	106	—	29.7	—	Vessel did not deviate to Marseilles.
Majestic . .	White Star Line	Sept., 1923	New York to Cherbourg *	3,104	5d. 5h. 21m.	24.76	613	** Vessel called at Marseilles.
Laurentie . .	"	June, 1930	Quebec to Liverpool ‡	2,444	5d. 21h. 15m.	17.80	—	
Empress of Britain	Canadian Pacific Steamships.	June, 1932	Quebec (Father Point) to Cherbourg	—	4d. 7h. 58m.	—	—	
Duchess of York	"	Sept., 1930	Greenock to Quebec	2,558	5d. 8h. 34m.	19.9	—	
Empress of Japan	"	Apr., 1931	Yokohama to Vancouver	—	7d. 20h. 16m.	—	—	
China . . .	P. & O.	Sept. 26 to Oct. 14, 1919	London to Bombay	6,258	17d. 20h.	15.7	—	
Viceroy of India	"	Sept. 17 to Oct. 3, 1932	London to Bombay	—	16d. 1h. 42m. **	17.92	—	
Rex . . . .	Italia Line.	Oct., 1932	New York to Gibraltar	—	5d. 7h.	—	—	
Reina del Pacifico	Pacific Steam Navigation Co.	June 18 to Aug. 17, 1931	Liverpool, Valparaiso, Liverpool, via Panama Canal	18,366	59d. 13h. (actual steaming 43d. 8h.)	17.47	458	

## DEVELOPMENT OF MARINE PROPELLING MACHINERY.

	Approximate Date of Introduction in the United Kingdom.			
	Merchant.		Naval.	
Compound engines . .	—	1860	—	1865
Triple-expansion engines	—	1880	—	1885
Quadruple-expansion do.	—	1890	Not fitted . . .	—
Cylindrical boilers . .	—	1862	—	1869
Water-tube boilers . .	Cross-channel . .	1911	Destroyers . . .	1893
	Ocean liners . .	1914	Battleships . . .	1897
Direct turbines . . .	Cross-channel . .	1901	Destroyers . . .	1898
	Ocean liners . .	1905	Light cruisers . .	1904
			Battleships . . .	1906
Combination engines and turbines . . . . .	Intermediate liner .	1908	(For cruising only)	1902
Combination machinery on common line shafting (Bauer-Wach) . .	Intermediate liner and cargo steamers	1926	—	—
Geared turbines . . .	Single-reduction . .	1911	Single-reduction . .	1913
	Double-reduction . .	1916	Not fitted . . .	—
High pressure turbines .	Single-reduction . .	1926	Destroyers . . .	1926
Electric propulsion . .	First attempts . .	1904	Not fitted . . .	—
	Diesel-electric . .	1913	—	—
	Turbo-electric . .	1929	—	—
	(Large liner)			
Oil fuel burning . . .	First attempts . .	1870	Coal and oil—	
			Destroyers . . .	1902
			Battleships . . .	1904
	Modern plant . .	1892	Oil alone—	
			Destroyers . . .	1910
			Battleships . . .	1913
Heavy oil engines . . .	First attempts . .	1904	Tender . . . . .	1914
	Modern plant . .	1910	Submarines . . .	1908
	Double-acting . .	1924	Subm. depôt ship .	1928
	Supercharging . .	1925	—	—
Pulverised Coal Firing .	First attempts . .	1928	—	—

MARINE ENGINES UNDER CONSTRUCTION IN THE WORLD  
(Recorded by Lloyd's Register of Shipping as at the end of September, 1932).

Country in which building.	Steam Engines.				Oil Engines.		Total.	
	Reciprocating.		Turbines.					
	No.	I.H.P.	No.	S.H.P.	No.	I.H.P.	No.	H.P.
Gt. Britain & Ireland	44	58,476	3	215,400	14	13,000	61	286,876
British Dominions . .	2	1,950	—	—	—	—	2	1,950
Belgium . . . . .	1	700	—	—	3	20,200	4	20,900
Denmark . . . . .	3	2,050	—	—	5	15,400	8	17,450
France . . . . .	9	9,160	3	184,000	15	20,560	27	213,720
Germany . . . . .	5	3,700	2	6,800	18	64,745	25	75,245
Holland . . . . .	3	1,450	—	—	9	39,897	12	41,347
Italy . . . . .	1	2,100	1	101,000	10	67,550	12	170,650
Japan . . . . .	6	9,350	—	—	9	31,530	15	40,880
Norway . . . . .	2	1,900	—	—	1	3,000	3	4,900
Sweden . . . . .	4	5,500	—	—	49	54,446	53	59,946
Switzerland . . . . .	—	—	—	—	6	4,980	6	4,980
United States . . . .	1	1,000	11	141,500	5	8,480	17	150,980
Other Countries . . .	—	—	—	—	4	11,230	4	11,230
Total . . . . .	81	97,336	20	648,700	148	355,018	249	1,101,054

The horse-power is compiled from figures furnished by the engine makers.

## PROGRESS IN MARINE MACHINERY.

Type of vessel.	Year.	Dimensions.		Performance.		Engines.						Boilers.					Total weight of Machinery "Steam Up" (tons).	H.P. per ton of Machinery.	Coal Consumption (lbs. per H.P. hour).
		Length (feet).	Beam (feet).	Speed (knots).	Horse-power.	No. of Propellers.	Type of Machinery.*	No. of Cylinders.	Propeller revs. per min.	Piston speed (f.p.m.)	Referred M.P. (lb. per sq. in.)	No. and Type.†	Working press. (lb. per sq. in.)	System of Draught.‡	Heating Surface per H.P. (sq. ft.)	H.P. per sq. ft. of grate.			
Atlantic liners .	1881	500	50	18.0	10,680	1	C	3	64	770	29.1	-C	100	N	8.3	8.57	1,860	5.74	1.7
	1888	528	63	20.1	18,500	2	TE	3	86	860	35.3	9 DC	150	CS	2.75	14.3	2,516	7.4	1.6
	1893	600	65	22.0	30,000	2	TE	5	81	930	35	12 DC	165	N	2.78	11.4	4,985	6.1	1.6
	1899	685	68	20.7	27,000	2	TE	4	78	936	35	15 DC	182	AD	2.77	18.75	4,414	6.1	1.4
	1907	760	87	26.0	72,500	4	T	—	180	—	—	23 DC & 2 C	185	H	2.19	17.9	9,936	7.3	1.4
	1914	865	96	23.5	60,000	4	T	—	180	—	—	21 DC	195	H	2.31	16.9	9,302	6.5	1.3
Intermediate Ocean liners .	1891	912	100	23.5	68,000	4	T	—	180	—	—	48 W	280	FD	3.93	16.4	16,302	—	—
	1890	400	45	12.5	3,000*	1	C	2	61	671	20.5	2 C	90	N	8.1	7.6	685	4.35	2.4
	1892	470	53	12.5	3,500*	2	TE	2	80	640	32.0	2 DC & 1 C	170	N	8.3	10.0	795	4.4	1.9
	1911	520	64	14.5	7,500*	2	TE	4	82	738	37.0	5 DC	210	N	8.25	11.75	1,750	4.35	1.6
	1914	550	66	16.5	11,000§	2	GT	—	133	1,630P	—	5 DC	210	H	2.5	17.5	1,800	6.1	1.4
	1920	550	66	17.0	11,000§	2	GT	—	85	(2,000)Q	—	5 Wz	250	OD	2.25	—	1,210	9.1	0.9a
Cargo steamers .	1877	314	35	11.25	775*	1	FC	—	52	450	23	1 OC	70	N	4.46	7.6	200	9.87	2.5
	1885	320	38	12.25	1,650*	1	TE	—	70	560	31.5	2 C	150	N	2.82	10.4	340	4.95	1.95
	1911	440	52	13.25	4,200*	1	TE	—	73	750	35	2 C	190	FD	2.8	16.25	800	4.97	1.65
	1914	450	56	14.25	5,000§	1	GT	—	102	1,350P	—	2 C	195	H	2.30	20.0	930	6.45	1.45
Cross-Channel Steamers .	1920	503	63	14.25	7,000§	2	DT	—	80	(1,800)Q	—	3 FCz	200	OD	2.25	—	1,100	6.35	0.85a
	1890	300	35	18.00	4,400*	2	TE	3	130	780	30.75	5 C	160	N	2.6	12.25	590	7.45	2.25
	1898	315	37	19.75	5,520*	2	TE	4	165	910	43.0	2 DC & 1 C	180	FD	1.95	17.5	610	9.62	2.1
	1904	330	42	19.5	5,500§	3	T	—	550	550P	—	7 W	160	FD	1.9	16.5	580	9.3	1.8
Motor ships .	1910	316	41	21.5	8,500§	3	T	—	625	625P	—	8 W	195	FD	1.95	16.0	735	11.6	1.7
	1920	302	36	23.5	12,300§	2	GT	—	435	(2,600)Q	—	8 W	195	FD	2.00	22.0	1,055	11.65	1.5
	1925	329	45	22.25	—	2	GT	—	270	—	—	5 W	200	FD	—	—	—	—	—
	1909	210	38	8.5	490*	1	4 S	6	140	550	99y	Steam auxiliaries	—	—	—	—	91	4.32	0.6a
	1910	260	43	10.5	1,460*	1	4 S	6	125	820	111y	"	—	—	—	—	220	5.01	0.5a
	1912	380	53	11.0	2,500*	2	4 S	8	140	670	89.8y	Electric	—	—	—	—	890	4.84	0.47a

\* C = Vertical Compound; F.C. = Tandem Compound with flywheel; TE = triple expansion; QE = quadruple expansion; T = turbines; GT = geared turbines; DT = double-reduction geared turbines; ED = electric drive; 4S = 4-cycle single acting motors; 4D = 4-cycle double-acting motors; 2S = 2-cycle single acting motors. † C = cylindrical; OC = oval ends and cylindrical middle portion; DC = double-ended cylindrical; FC = oil-fired cylindrical; W = water-tube (oil-fired). ‡ N = natural draught; AD = assisted draught; CS = closed stockhold; FD = forced draught; H = Howden's forced draught; OD = oil-burning with forced draught. § I.H.P. † B.H.P. ‡ turbine revs. per min. § Mean Pressures for motorships are on I.H.P. basis. ¶ with superheaters. a Oil.



NUMBERS OF MERCHANT VESSELS USING THE VARIOUS TYPES OF PROPULSION.\*

(Excluding vessels of less than 100 tons gross.) As at June, 1932.

Country.	Oil Engines.	Steam Turbines.	Steam Reciprocating Engines.	Auxiliary Steam Engines.	Auxiliary Oil Engines.	Sails.	Totals.
Great Britain and Ireland .	511	325	6,682	—	74	379	7,971
British Dominions . . .	221	27	1,833	3	96	367	2,547
British Empire . . . .	732	352	8,515	3	170	746	10,518
United States . . . . .	288	541	1,840	—	25	558	3,252
Belgium . . . . .	32	11	192	—	2	3	240
Denmark . . . . .	117	15	481	2	87	28	730
France . . . . .	72	76	1,331	1	38	126	1,644
Germany . . . . .	211	63	1,574	5	282	16	2,151
Greece . . . . .	3	1	536	—	11	—	551
Holland . . . . .	400	59	862	—	103	21	1,445
Italy . . . . .	131	55	825	3	77	232	1,323
Japan . . . . .	220	46	1,508	60	130	—	1,964
Norway . . . . .	366	9	1,557	16	53	7	2,008
Spain . . . . .	66	11	657	7	52	68	861
Sweden . . . . .	151	12	1,040	2	148	80	1,433
Other Countries . . . .	301	13	2,699	3	142	395	3,553
Total . . . . .	3,090†	1,264‡	23,617§	102	1,320	2,280	31,673

\* Excluding American Great Lakes vessels and Japanese sailing vessels.

† Includes 48 ships fitted with Diesel-electric drive.

‡ Includes 42 ships fitted with turbo-electric drive.

§ Includes 228 ships fitted with a combination of reciprocating and turbine engines.

COMPARISON OF RUNNING COSTS OF STEAM- AND MOTORSHIPS.

DEADWEIGHT CAPACITY, 8,000 TONS. SPEED, 10½ KNOTS. VOYAGE, 30 DAYS.

Type of Machinery .	S.S. Diesel 2,200 B.H.P.	S.S. Geared Turbines. 2,200 S.H.P.	S.S. Recip. 2,500 I.H.P.	S.S. Recip. Bauer Wach 2,500 I.H.P.
Fuel . . . . .	Oil.	Coal.	Coal.	Coal.
Fuel 163/h.p. hour . .	0·4	1·56	1·65	1·25
„ tons day . . . .	9·4	36·7	44·2	33½
„ voyage . . . . .	282	1,101	1,326	1,005
Price, fuel/ton . . .	£3 5s.	£1 5s.	£1 5s.	£1 5s.
Cost/voyage . . . .	£916 10s.	£1,376 5s.	£1,657 10s.	£1,256 5s.
Lub. oil, galls./day . .	14	6	4	6
„ cost/gall. . . . .	2s. 2d.	2s. 2d.	1s. 9d.	2s. 2d.
„ voyage . . . . .	£45	£19 10s.	£10 10s.	£19 10s.
E.R. staff . . . . .	8	21	21	21
Wages/voyage . . . .	£151	£228 10s.	£228 10s.	£228 10s.
Provision/voyage . . .	£30	£78 15s.	£78 15s.	£78 15s.
Wages, fuel, lub. oil, and provisions/voyage . .	£1,132 10s.	£1,708	£1,975 5s.	£1,583
Running costs—Ratio .	1	1·5	1·74	1·4
Comparative cost— Fuel winches/harbour .	£28 10s. (electric)	£96 5s. (steam)	£96 5s. (steam)	£96 5s. (steam)

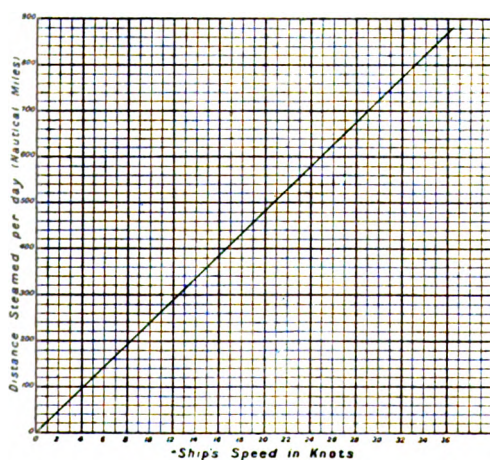
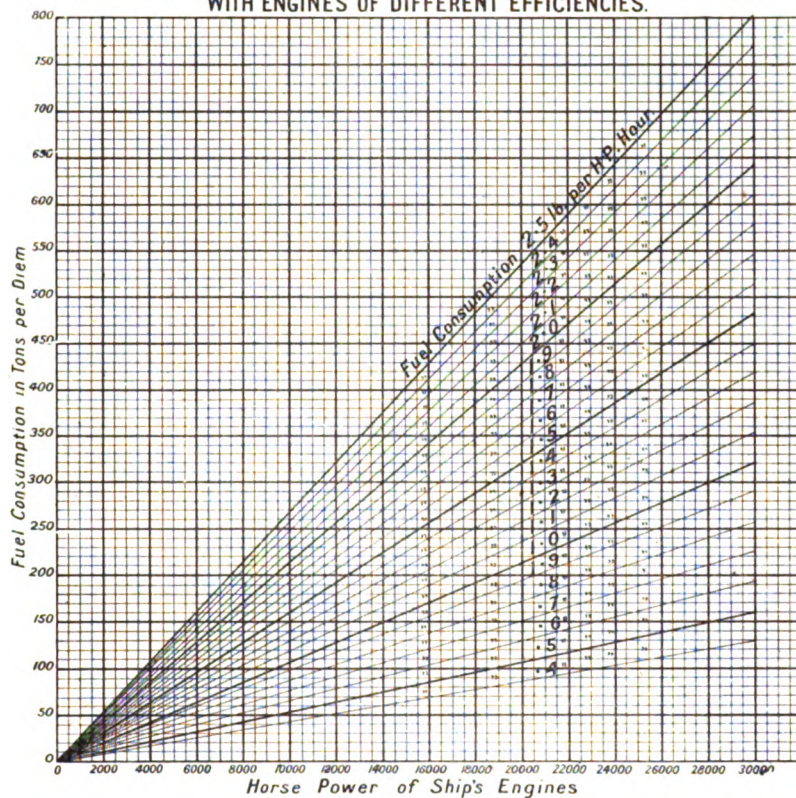
NOTABLE MOTORSHIPS.

Date.	Name.	Gross tonnage.	Dimensions. (ft.)	Owners.	Builders.	Machinery makers.	Type of engine.	Cycle.	No. of eng.	Total B.H.P.	Revs. per min.
1912	Juno	2,345	257.6 × 43.1 × 18.6	Nederl. Indische Tank- stoomboot Maats.	Nederl. Schs. Maats.	Werkspoor	Werkspoor	4 single act.	1	1,100	125
1918	Aba	7,937	450.5 × 55.8 × 36.6	Elder Dempster	Barclay, Curle and Co.	Harland & Wolff	B. & W.	4 single act.	2	5,250	115
1922	Pacific Commerce	5,089	420.0 × 54.0 × 25.0	Furness Withy	Wm. Doxford and Sons	Doxford	Doxford	2 opposed pistons 2 single act.	1	2,700	77
1923	Brazza	10,193	453.1 × 59.1 × 36.1	Chargeurs Réunion	Atel. & Ch. de la Loire	Sulzer	Sulzer	2 double act.	2	3,400	85
1924	Dolius	5,994	407.0 × 52.2 × 28.4	A. Holt & Co.	Scott's S.B. & E. Co.	Scott's S.B. & E. Co.	Still	2 double act.	2	2,500	120
1924	Aorangi	17,491	580.1 × 72.2 × 43.4	Canadian Australa- sian Line	Fairfield S.B. & E. Co.	Fairfield S.B. & E. Co.	Sulzer	2 single act.	4	13,000	135
1925	Gripsholm	17,716	553.0 × 74.4 × 37.7	Swedish-America Line	Armstrong Whit- worth & Co.	Burmeister & Wain	B. & W.	4 double act.	2	13,500	125
1925	Asturias	22,071	630.5 × 78.5 × 40.5	Royal Mail	Harland & Wolff	Harland & Wolff	B. & W.	4 double act.	2	16,500	125
1926	Carnarvon Castle	20,063	630.7 × 73.5 × 41.5	Union Castle	Harland & Wolff	Harland & Wolff	B. & W.	4 double act.	2	13,000	105
1927	Saturnia	23,940	631.4 × 79.8 × 29.5	Cosulich Line	C.N. Triestino	Stab. Tec. Triestino	B. & W.	4 dbl. act. with super chargers	2	20,000	125
1927	Augustus	32,650	710.9 × 82.8 × 46.5	Italia Line	Soc. Anon. Ansaldo	M.A.N. & Cant. Off.	M.A.N.	2 double act.	4	25,000	120
1928	Kungsholm	20,223	594.9 × 78.2 × 37.8	Swedish-America Line	Blohm & Voess	Savoia Burmeister & Wain	B. & W.	4 double act.	2	15,000	100
1930	Britannic	26,943	683.6 × 82.4 × 48.6	White Star Line	Harland & Wolff	Harland & Wolff	B. & W.	4 double act.	2	20,000	110

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DAILY FUEL CONSUMPTION OF STEAMERS & MOTOR SHIPS  
WITH ENGINES OF DIFFERENT EFFICIENCIES.



DISTANCE STEAMED IN ONE DAY  
BY SHIPS OF DIFFERENT SPEEDS.

NATIONALITY AND NET TONNAGE OF VESSELS WHICH ENTERED AND CLEARED WITH CARGOES IN THE FOREIGN  
TRADE OF THE UNITED KINGDOM FOR THE YEARS 1913, 1930, AND 1931.  
(Thousands of Net Tons).

Nationality.	Entrances.			Clearances			Percentage Entrances.			Percentage Clearances.		
	1913.	1930.	1931.	1913.	1930.	1931.	1913.	1930.	1931.	1913.	1930.	1931.
British . . . . .	Tons. 32,292	Tons. 40,787	Tons. 38,212	Tons. 40,101	Tons. 42,621	Tons. 38,164	65.8	64.0	63.4	59.1	64.7	65.4
Foreign :—												
Norwegian . . . . .	3,285	2,705	2,696	4,683	2,196	1,619	6.7	4.2	4.5	6.9	3.3	2.8
American . . . . .	724	2,995	2,386	370	1,504	1,350	1.5	4.7	4.0	0.5	2.3	2.3
Swedish . . . . .	1,891	1,949	1,674	3,016	1,720	1,336	3.9	3.1	2.8	4.5	2.6	2.3
Dutch . . . . .	1,702	3,157	3,254	2,536	3,286	3,026	3.5	5.0	5.3	3.7	5.0	5.2
Danish . . . . .	1,161	1,866	1,999	2,613	1,952	1,719	2.4	2.9	3.3	3.9	3.0	2.9
French . . . . .	999	2,230	2,266	1,975	3,242	3,087	2.0	3.5	3.8	2.9	4.9	5.3
Belgian . . . . .	1,369	1,321	1,419	957	1,098	1,143	2.8	2.1	2.3	1.4	1.7	2.0
Japanese . . . . .	140	551	504	282	453	487	0.3	0.9	0.8	0.4	0.7	0.8
Spanish . . . . .	1,060	674	570	1,694	1,325	1,231	2.2	1.1	0.9	2.5	2.0	2.1
Italian . . . . .	122	576	512	955	1,162	887	0.2	0.9	0.9	1.4	1.8	1.5
Russian* . . . . .	678	—	—	937	—	—	1.4	—	—	1.4	—	—
Greek . . . . .	221	638	530	1,072	1,314	850	0.4	1.0	0.9	1.6	2.0	1.5
German . . . . .	3,166	2,558	2,532	5,730	2,056	1,842	6.4	4.0	4.2	8.5	3.1	3.2
Austro-Hungarian* . . . . .	128	—	—	715	—	—	0.3	—	—	1.0	—	—
Other Nationalities . . . . .	125	1,708	1,776	185	1,944	1,599	0.2	2.7	2.9	0.3	3.0	2.7
Total Foreign . . . . .	16,772	22,928	22,098	27,720	23,233	20,176	34.2	36.0	36.6	40.9	35.3	34.6
Total British and Foreign . . . . .	49,064	63,715	60,300	67,821	65,854	58,340	100.0	100.0	100.0	100.0	100.0	100.0

\* Included in "Other Nationalities."

Entrances and Clearances.				Percentages.			
1913.	1930.	1931.		1913.	1930.	1931.	
Tons.	Tons.	Tons.					
British . . . . .	72,393	83,408	76,376	62	64	64.4	
Foreign . . . . .	44,492	46,161	42,264	38	36	35.6	
Total . . . . .	116,885	129,569	118,640	100	100	100.0	

## ENTRANCES AND CLEARANCES IN THE FOREIGN TRADE OF THE UNDERMENTIONED COUNTRIES FOR THE YEARS 1913, 1930, AND 1931.

Note.—C=With Cargo only.

C &amp; B=With Cargo and in Ballast.

Countries.		Entrances.			Clearances.		
		1913.	1930.	1931.	1913.	1930.	1931.
		Thousand tons net.	Thousand tons net.	Thousand tons net.	Thousand tons net.	Thousand tons net.	Thousand tons net.
United Kingdom	C	49,068	63,720	60,300	67,824	65,856	58,344
United States of America	C	33,924	59,712	53,244	44,484	63,312	58,452
France	C	34,512	60,996	57,672	26,112	51,048	48,264
Japan	C & B	24,720	56,436	54,768	24,900	56,328	54,672
Netherlands	C	17,148	26,856	21,924	11,016	20,748	16,344
Spain	C	11,605	17,736	17,100	23,484	27,984	23,628
British India	C	6,700	8,184	7,308	8,256	8,304	7,476
Australia	C & B	5,364	5,448	5,580	5,232	5,496	5,664
South Africa	C & B	5,352	5,412	4,968	5,280	5,448	4,956
Norway	C	3,756	4,260	4,104	4,740	5,916	3,396
Belgium	C & B	16,908	29,112	27,792	16,896	28,968	27,660
Sweden	C	13,764	13,596	13,848	17,004	14,664	12,720
Germany	C	26,580	34,176	31,152	26,640	28,908	27,876

## ABOVE AS PERCENTAGES OF 1913 FIGURES.

United Kingdom	100	130	123	100	97	86
United States of America	100	176	157	100	142	131
France	100	177	167	100	195	185
Japan	100	228	222	100	226	220
Netherlands	100	157	128	100	188	148
Spain	100	153	147	100	119	101
British India	100	122	109	100	101	91
Australia	100	102	104	100	105	108
South Africa	100	101	93	100	103	94
Norway	100	113	109	100	125	72
Belgium	100	172	164	100	171	164
Sweden	100	99	101	100	86	75
Germany	100	129	117	100	109	105

NUMBER AND NET TONNAGE OF VESSELS THAT PASSED THROUGH THE SUEZ CANAL IN THE  
YEARS 1913, 1929, 1930, AND 1931, DISTINGUISHING THE PRINCIPAL NATIONALITIES.

Nationality of Vessels.	Number of Passages.			Net Tonnage of Vessels.			Numbers as Percentages of Total.					Tonnes as Percentages of Total.				
	1913.	1929.	1930.	1931.	1913.	1929.	1930.	1931.	1913.	1929.	1930.	1931.	1913.	1929.	1930.	1931.
British . . . . .	2951	3517	3125	2976	12,032,484	19,114,282	17,600,483	16,624,352	58.0	56.0	54.2	55.5	60.2	57.1	55.6	55.4
Japanese . . . . .	68	163	156	196	343,732	951,510	938,700	1,153,133	1.3	2.6	2.7	3.6	1.7	2.8	3.0	3.8
Dutch . . . . .	342	653	591	444	1,287,354	3,544,416	3,312,631	2,848,368	6.7	10.4	10.3	8.3	6.4	10.6	10.5	9.5
French . . . . .	256	399	357	354	927,787	2,165,511	2,001,837	2,084,035	5.0	6.4	6.2	6.6	4.6	6.5	6.3	6.9
Italian . . . . .	110	319	307	286	290,576	1,524,890	1,502,559	1,424,095	2.2	5.1	5.3	5.3	1.5	4.5	4.7	4.7
Danish . . . . .	56	84	83	70	171,848	403,603	431,365	366,532	1.1	1.3	1.4	1.3	0.9	1.2	1.4	1.2
Norwegian . . . . .	44	148	193	151	93,313	701,881	965,827	745,740	0.9	2.4	3.4	2.8	0.5	2.1	3.1	2.5
American (U.S.) . . . . .	8	118	106	103	7,476	703,155	670,391	624,535	0.2	1.9	1.8	1.9	—	2.1	2.1	2.1
Swedish . . . . .	33	76	73	79	122,957	367,767	354,266	383,254	0.7	1.2	1.3	1.5	0.6	1.1	1.1	1.3
Greek . . . . .	17	68	54	25	54,500	187,492	95,363	52,609	0.3	1.1	0.9	0.5	0.3	0.6	0.3	0.2
Spanish . . . . .	26	6	3	—	75,643	17,800	9,032	—	0.5	0.1	0.1	—	0.4	0.1	0.0	—
German . . . . .	778	620	600	568	3,352,287	3,455,402	3,388,842	3,314,750	15.3	9.9	10.4	10.6	16.7	10.3	10.7	11.0
Austria-Hungarian . . . . .	246	—	—	—	845,830	—	129,554	175,494	4.8	—	—	—	4.2	—	—	0.6
Russian . . . . .	110	33	46	62	340,595	104,044	267,409	231,069	2.2	0.5	0.8	1.1	1.7	0.3	0.4	0.6
All others . . . . .	40	70	67	52	67,422	222,261	267,409	231,069	0.8	1.1	1.2	1.0	0.3	0.7	0.8	0.8
Total . . . . .	5085	6274	5761	5366	20,033,802	33,466,014	31,668,759	30,927,966	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NOTE.—The above figures include not only Merchant Vessels and Mail Steamers, but also Warships and Transports as well as Government Chartered Vessels.

NUMBER AND NET TONNAGE OF COMMERCIAL VESSELS THAT PASSED THROUGH THE PANAMA CANAL IN THE YEARS ENDED 30TH JUNE, 1920, 1922, 1924, 1926, 1928, 1930, 1931, AND 1932, DISTINGUISHING THE PRINCIPAL NATIONALITIES.

NOTE.—Commercial Vessels include all Vessels except those of the United States Government, or chartered by the U.S. Government to carry Government supplies, and Vessels of less than 10 tons measurement.

Nationality.	Number of Vessels.										Net Tonnage of Vessels.									
	1920.	1922.	1924.	1926.	1928.	1930.	1931.	1932.	1933.	1934.	1920.	1922.	1924.	1926.	1928.	1930.	1931.	1932.	1933.	1934.
British	753	935	1,265	1,423	1,842	1,536	1,390	1,054			2,760,188	3,795,526	6,097,611	7,039,542	8,976,960	8,006,982	7,518,171	5,905,997		
American (U.S.A.)*	1,129	1,095	2,947	2,432	2,753	2,885	2,417	1,917			3,791,058	4,971,509	15,806,899	12,565,255	13,752,957	14,534,495	12,601,893	10,760,751		
German	—	—	—	—	—	—	—	—			—	—	—	—	—	1,433,074	1,125,256	1,280,996		
Norwegian	—	106	136	306	313	371	363	311			397,632	385,007	546,633	987,040	1,181,189	1,690,101	1,743,798	1,580,439		
Japanese	—	118	189	171	188	163	193	179			515,243	872,466	815,468	946,028	900,282	803,182	1,070,532	980,349		
Chilean	—	79	53	47	32	46	42	5			212,000	150,398	176,472	121,901	121,901	164,152	177,928	8,586		
Danish	—	9	63	63	69	91	130	105			32,221	237,473	234,753	235,396	235,396	383,796	611,380	561,492		
Peruvian	—	75	60	64	53	2	2	3			191,689	161,890	189,046	149,162	140,393	87,150	71,988	3,367		
Dutch	—	29	66	93	137	141	125	117			152,535	293,428	551,761	530,652	644,800	627,760	573,080	553,085		
French	—	60	51	83	90	127	110	81			114,664	190,171	384,640	431,752	530,769	627,760	609,915	454,890		
Spanish	—	41	9	45	31	46	9	2			106,651	27,284	172,572	121,461	137,465	4,209	25,660	8,470		
Other Nationalities	79	112	299	538	896	447	389	394			272,133	342,287	1,159,847	1,657,045	2,704,894	1,084,704	1,490,690	1,546,704		
Totals	2,478	2,736	5,230	5,197	6,456	6,185	5,529	4,506			8,546,044	11,417,459	26,143,878	24,774,591	29,458,634	29,980,614	27,792,146	23,025,419		

# ABOVE AS PERCENTAGES.

Nationality.	Number of Vessels.										Net Tonnage of Vessels.									
	1920.	1922.	1924.	1926.	1928.	1930.	1931.	1932.	1933.	1934.	1920.	1922.	1924.	1926.	1928.	1930.	1931.	1932.	1933.	1934.
British	30.4	34.2	24.2	27.4	28.6	24.8	25.1	23.4			32.3	33.3	25.3	28.4	30.4	26.7	27.0	25.0		
American (U.S.A.)*	45.6	40.0	56.3	46.8	42.6	46.7	43.7	42.5			44.4	43.5	60.5	50.7	46.7	48.5	45.3	46.7		
German	—	—	—	—	—	—	—	—			—	—	—	—	—	—	—	—		
Norwegian	4.3	4.1	2.6	5.9	4.8	6.0	6.6	6.9			4.7	3.4	2.1	4.0	—	4.8	5.1	5.4		
Japanese	—	4.8	3.3	2.5	2.9	2.6	3.5	4.0			6.0	7.6	5.1	3.8	3.1	5.5	6.3	6.5		
Chilean	—	3.2	0.8	5.0	0.5	0.8	0.8	0.7			2.5	1.3	0.7	0.5	0.5	0.6	0.6	0.0		
Danish	—	0.3	2.0	1.3	1.1	1.5	2.2	2.4			0.4	2.0	0.9	1.0	1.0	1.3	2.2	2.4		
Peruvian	—	3.0	1.3	1.3	0.8	0.0	0.0	0.1			2.2	1.4	0.7	0.6	0.5	0.0	0.0	0.0		
Dutch	—	1.2	2.4	1.8	2.1	2.3	2.2	2.6			1.8	1.7	2.1	2.1	2.2	2.1	2.2	2.3		
French	—	2.4	1.6	1.7	2.1	2.0	2.2	1.8			1.3	1.6	1.5	1.7	2.0	2.1	2.2	1.9		
Spanish	—	1.6	0.9	0.6	0.7	0.7	0.2	0.0			3.2	0.2	0.7	0.5	0.5	0.5	0.5	0.0		
Other Nationalities	3.2	4.1	5.8	0.5	13.9	7.2	7.0	8.7			—	3.0	4.4	6.7	9.1	5.6	5.4	6.6		
Totals	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0			100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		

\* Includes Vessels engaged in the coasting trade of the U.S.A., which is carried on *entirely* by National Ships.  
+ Included with "Other Nationalities" in previous years.



CARGOES (IN TONS WEIGHT) CARRIED IN COMMERCIAL VESSELS THAT PASSED THROUGH THE PANAMA CANAL DURING THE YEARS ENDED 30TH JUNE, 1920, 1922, 1924, 1926, 1928, 1930, 1931, AND 1932, DISTINGUISHING THE PRINCIPAL NATIONALITIES.

Nationality of Vessels.	Weight of Cargoes carried.							
	1920.	1922.	1924.	1926.	1928.	1930.	1931.	1932.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
British . .	2,830,268	3,329,861	6,051,842	6,750,843	8,075,022	7,572,969	5,971,281	4,638,068
American (U.S.A.)	4,547,140	4,950,519	16,654,435	13,710,956	14,258,735	14,499,233	11,805,132	8,835,055
German . .	—	—	—	—	—	1,888,022*	1,261,763*	1,078,738*
Norwegian .	404,323	408,268	539,101	1,051,276	1,268,124	1,808,278	1,720,388	1,427,284
Japanese . .	726,338	1,044,515	935,245	667,982	1,041,166	1,009,735	1,104,512	1,031,704
Chilean . .	104,738	46,182	107,147	82,695	81,678	105,511	99,234	6,420
Danish . .	42,533	272,779	317,274	295,530	380,240	505,914	606,100	521,481
Peruvian . .	119,418	64,370	102,136	94,778	96,175	13,107	7,328	4,615
Dutch . .	123,442	290,573	573,929	552,741	637,178	618,718	477,769	440,870
French . .	125,249	139,463	407,249	398,393	600,421	576,753	508,011	338,786
Spanish . .	101,563	23,701	67,903	49,956	104,606	8,250	27,030	7,650
Other Nationalities .	244,487	314,679	1,238,449	2,382,298	3,097,364	1,923,742	1,494,257	1,477,327
Totals .	9,374,499	10,884,910	26,994,710	26,037,448	29,630,709	30,030,232	25,082,800	19,807,998

## ABOVE AS PERCENTAGES.

	1920	1922.	1924.	1926.	1928.	1930.	1931.	1932.
British . .	30.2	30.6	22.4	25.9	27.2	25.2	23.8	23.4
American (U.S.A.)	48.5	45.5	61.7	52.7	48.2	48.3	47.1	44.6
German . .	—	—	—	—	—	4.6*	5.0*	5.4
Norwegian .	4.3	3.7	2.0	4.0	4.3	6.0	6.9	7.2
Japanese . .	7.7	9.6	3.5	2.6	3.5	3.4	4.4	5.2
Chilean . .	1.1	0.4	0.4	0.3	0.3	0.4	0.4	0.0
Danish . .	0.5	2.5	1.2	1.1	1.3	1.7	2.4	2.6
Peruvian . .	1.3	0.6	0.4	0.4	0.3	0.0	0.0	0.0
Dutch . .	1.4	2.7	2.1	2.1	2.2	2.1	1.9	2.2
French . .	1.3	1.3	1.5	1.5	2.0	1.9	2.0	1.7
Spanish . .	1.1	0.2	0.3	0.2	0.3	0.0	0.1	0.0
Other Nationalities .	2.6	2.9	4.5	9.2	10.4	6.4	6.0	7.7
Totals .	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

\* Included with "Other Nationalities" in previous years.





## "LAID-UP" STEAM TONNAGE OF PRINCIPAL MARITIME COUNTRIES.

	Jan. 1st, 1927.	Jan. 1st, 1928.	Jan. 1st, 1929.	Jan. 1st, 1930.	Jan. 1st, 1931.	July 1st, 1931.	Jan. 1st, 1932.	July 1st, 1932.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Gt. Brit. & Ireland	529,000	575,000	528,000	564,000	2,549,000	3,271,000	3,146,000	3,514,000
Australia . . .	71,000	†	†	†	†	141,000	165,000	112,000
United States :—								
Shipping Board .	2,336,000	2,405,000	2,144,000	1,588,000	1,443,000	1,295,000	1,341,000	1,522,000
Ship. Bd. Tankers	56,000	†	†	†	†	†	†	†
Govt. owned, other								
than U.S. S. Bd.	27,000	†	†	†	†	†	†	†
Privately owned .	457,000	726,000	818,000	666,000	1,216,000	1,255,000	1,843,000	1,903,000
U.S. total . . .	2,876,000	3,131,000	2,962,000	2,254,000	2,659,000	2,550,000	3,184,000	3,425,000
Belgium . . .	14,000†	†	†	†	†	106,000	187,000	231,000
Denmark . . .	20,000	†	†	†	131,000	148,000	210,000	231,000
France . . .	118,000	177,000	133,000	90,000	219,000	567,000	751,000	983,000
Greece . . .	106,000†	77,000	74,000	87,000	223,000	303,000	180,000	498,000
Holland . . .	3,000	16,000	9,000	4,000	324,000	474,000	595,000	755,000
Italy . . .	110,000	312,000	250,000	170,000	649,000	760,000	800,000	863,000
Japan . . .	48,000	49,000	46,000	44,000	323,000	196,000	359,000	226,000
Norway . . .	37,000†	136,000	19,000	13,000	572,000	817,000	942,000	801,000
Spain . . .	35,000	52,000	31,000	25,000	102,000	85,000	139,000	254,000
Sweden . . .	9,000	28,000	2,000	2,000	106,000	118,000	186,000	152,000
Other Countries .	100,000	†	†	†	†	†	1,034,000	1,138,000
World's total . .	4,076,000	4,553,000	4,054,000	3,253,000	7,857,000	9,586,000	11,878,000	13,183,000

† No data available.

‡ Figures at October, 1926, available only.

## PAY IN THE MERCHANT SERVICE.—MONTHLY RATES.

*Foreign-going Cargo Steamers.\**

Rating.	1914.				1924.†				1925-31.‡						
	£	s.	£	s.	£	s.	£	s.	£	s.	£	s.			
First Mates . . .	12	5	to	14	5	17	10	to	26	10	16	0	to	25	0
Second Mates . . .	9	5	„	12	15	15	0	„	18	10	13	10	„	17	0
Third Mates . . .	7	10	„	10	10	13	0	„	14	0	11	10	„	12	10
Chief Engineers .	16	15	„	24	0	21	10	„	34	10	20	0	„	33	0
Second Engineers .	12	5	„	14	15	17	10	„	26	10	16	0	„	25	0
Third Engineers .	8	15	„	11	15	15	0	„	18	10	13	10	„	17	0
Carpenters . . .	7	0	„	7	10	12	10	„	16	10	11	10	to	15	10
Boatswains . . .	6	5	„	6	10	11	10	(Fixed			10	10	(Fixed		
								rate.)					rate.)		
Firemen . . . . .	5	10	„	6	0	10	10	„			9	10	„		
Able Seamen . . .	5	0	„	5	10	10	0	„			9	0	„		

\* On Oil-Tank Vessels the rates are supplemented by the following percentage additions :—

Chief Engineers . . . . .	12½ per cent.
First Mates and Second Engineers . . . . .	10 „
Other Mates and Engineers . . . . .	7½ „

On Motor Vessels there is a special National Standard Scale of Pay for Engineer Officers substantially higher than on steam-driven vessels.

† The 1924 figures are the National Maritime Board standard rates of pay, effective from September 5, 1924, and based, in the case of Navigating and Engineer Officers, on tonnage and seniority.

‡ The rates payable to Navigating and Engineer Officers are subject to a reduction of 10 per cent. as from January 31, 1932.

On Passenger Liners, Navigating and Engineer Officers, as a rule, receive now, as before the War, wages from 10 to 20 per cent. higher than the Standard Cargo-Vessel rates.

## EXPORTS OF NEW SHIPS FROM THE UNITED KINGDOM.

## SHIPS NOT REGISTERED AS BRITISH, WITH THEIR MACHINERY.

Year.	War Vessels (including Machinery and Armament).	Steam Ships (other than War Vessels).		Sailing Ships (other than War Vessels) including Boats.	Total of New Ships.
		Hulls and Fittings.	Machinery.		
	£	£	£	£	£
1903	74,480	2,798,737	1,222,108	188,504	4,283,829
1904	388,600	2,670,835	1,164,779	330,937	4,455,151
1905	50,000	3,693,422	1,516,183	171,693	5,431,298
1906	2,800,000	3,973,873	1,668,592	201,706	8,644,171
1907	554,700	6,586,449	2,550,702	326,262	10,018,113
1908	1,879,994	5,902,428	2,505,280	189,773	10,567,475
1909	247,000	3,698,556	1,819,618	161,940	5,927,114
1910	4,894,500	2,553,427	1,209,119	113,158	8,770,204
1911	25,000	3,745,349	1,632,402	259,564	5,663,115
1912	765,000	4,243,308	1,750,351	268,503	7,027,162
1913	2,617,100	5,867,179	2,336,509	205,742	11,026,530
1914	308,385	4,716,226	1,784,900	123,043	6,932,554
1915	—	1,170,606	472,597	49,548	1,692,661
1916	20,000	754,372	481,703	34,510	1,290,585
1917	—	706,084	347,354	33,869	1,087,307
1918	—	778,525	229,292	39,517	1,047,334
1919	—	1,703,961	505,652	118,718	2,328,331
1920	—	26,280,243	—	295,771	26,576,016
1921	—	29,523,833	—	470,615	29,994,448
1922	—	30,222,080	—	220,435	30,442,515
1923	—	9,566,187	—	148,474	9,714,661
1924	—	5,257,957	—	264,388	5,522,345
1925	14,354	5,996,585	—	265,384	6,276,323
1926	19,300	4,314,414	—	296,265	4,629,979
1927	45,389	4,233,509	—	251,768	4,530,655
1928	5,143,150	10,439,794	—	315,680	15,575,749
1929	3,820,250	11,487,076	—	203,840	15,511,166
1930	707,400	19,091,308	—	343,708	20,142,416
1931	600,000	8,534,403	—	148,872	9,283,275

## HIGHEST AND LOWEST IRON AND STEEL PRICES, 1914-1932.

	1914.			1918.			1920.			1924.			1930.			1931.			1932.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Marked Iron Bars, {	9	0	0	20	0	0	33	10	0	15	0	0	12	10	0	12	10	0	12	0	0
S. Staffs . . . {	8	10	0	14	15	0	26	15	0	14	10	0				12	0	0			
Common Iron Bars, {	8	2	6	20	0	0	30	0	0	12	10	0	10	15	0	10	15	0	10	0	0
Cleveland . . . {	7	10	0	14	15	0	24	5	0	12	0	0				10	0	0	9	15	0
Steel Ship Plates, 3-in., {	7	10	0	16	10	0	24	10	0	10	10	0	8	17	6	8	17	6	8	17	6
Middlesbrough . {	7	0	0	11	10	0	20	0	0	9	10	0	8	15	0*	8	15	0*	8	15	0*
Steel Ship Plates, {	7	5	0	16	10	0	28	5	0	12	10	0	8	15	0*	8	15	0*	8	15	0*
Glasgow . . . {	6	17	6	11	10	0	21	10	0	9	15	0									
Steel Boiler Plates, {	8	5	0	17	10	0	31	0	0	14	0	0	10	10	0	10	5	0	9	15	0
Middlesbrough . {	8	0	0	12	10	0	23	0	0	13	0	0	9	7	6	8	15	0	8	7	6
Steel Boiler Plates, {	7	5	0	17	10	0	31	10	0	14	0	0	10	10	0	10	10	0	9	0	0
Glasgow . . . {	7	0	0	12	10	0	24	0	0	13	0	0	10	0	0	8	15	0	8	15	0

\* Subject to rebate.

**OCEAN DISTANCES FROM THE BRITISH ISLES.**  
(Steaming Distances in Nautical Miles.)

**I.—CONTINENT.**

	Ambergel.	Christiana.	Copenhagen.	Stockholm.	Danvig.	Hamburg.	Amsterdam.	Rotterdam.	Antwerp.	Havre.	Bordeaux.	Bilbao.	Lisbon.	Gibraltar.
Cardiff	2,259†	1,000*	1,126*	1,498*	1,400*	839	577	553	541	367	531	561	878	1,145
Glasgow	2,036†	930†	996†	1,408†	1,280†	490	818	794	782	610	778	808	1,093	1,400
Liverpool	2,104†	1,005†	1,066†	1,478†	1,340†	942	711	687	675	503	671	701	1,010	1,290
London	2,106	702	700	1,180	989	427	188	177	180	198	682	712	1,058	1,325
Sunderland	1,755	520	586	998	860	413	258	266	327	397	896	915	1,225	1,615

\* South about.

† North about.

**II.—MEDITERRANEAN, BLACK SEA AND RED SEA.**

	Marseilles.	Naples.	Messina.	Malta.	Genoa.	Trieste.	Athens.	Constantinople.	Odessa.	Batoum.	Smyrna.	Alexandria.	Port Said.	Aden.
Cardiff	1,870	2,080	2,170	2,135	2,039	2,804	2,630	2,910	3,230	3,490	2,765	2,922	3,075	4,515
Glasgow	2,085	2,295	2,475	2,350	2,254	3,019	2,864	3,125	3,445	3,705	2,980	3,137	3,300	4,730
Liverpool	1,976	2,205	2,367	2,240	2,144	2,909	2,759	3,069	3,335	3,595	2,870	3,083	3,290	4,620
London	2,050	2,260	2,354	2,315	2,219	2,984	2,810	3,170	3,410	3,670	2,945	3,122	3,248	4,695
Sunderland	2,222	2,540	2,520	2,511	2,381	3,164	2,990	3,370	3,690	3,950	3,225	3,382	3,445	4,975

**III.—AFRICA AND EASTERN ATLANTIC, ETC.**

	Anora.	St. Vincent (C.V.I.)	Las Palmas.	Bathurst.*	Freetown.	Lagos.	Ascension.	London.†	St. Helena.	Cape Town.	Durban.	Mauritius.‡	Melbourne.‡ (Australia).	Robert.‡ (Tasmania).
Cardiff	1,330	2,345	1,523	2,484	2,838	3,068	3,775	4,841	4,472	5,947	6,721	8,273	11,761	11,785
Glasgow	1,495	2,560	1,745	2,706	3,059	4,189	3,940	5,056	4,637	6,168	6,942	8,494	11,982	12,006
Liverpool	1,385	2,450	1,655	2,616	2,962	4,097	3,830	4,946	4,527	6,076	6,850	8,402	11,890	11,914
London	1,460	2,525	1,699	2,660	3,008	4,138	3,900	5,021	4,597	6,117	6,891	8,433	11,931	11,955
Sunderland	1,740	2,805	1,890	2,851	3,199	4,320	4,185	5,301	4,882	6,308	7,082	8,534	12,122	12,146

\* Via Tenerife and Dakar.

† Via St. Vincent (C.V.I.).

‡ Via Cape Town.

**IV.—INDIAN OCEAN, ETC. (via SUEZ).**

	Kasch.	Bombay.	Colombo.	Zanzibar.	Mauritius.	Madras.	Calcutta.	Rangoon.	Singapore.	Batavia.	Fremantle (W. Australia).	Adelaide.	Melbourne.	Robert.
Cardiff	5,930	6,150	6,615	6,195	6,825	7,016	7,610	7,845	8,165	8,450	9,745	10,712	11,070	11,100
Glasgow	6,145	6,365	6,830	6,433	7,040	7,120	7,854	8,060	8,380	8,635	9,960	10,953	11,285	11,315
Liverpool	6,135	6,355	6,720	6,320	6,930	7,065	7,750	7,955	8,270	8,555	9,850	10,847	11,175	11,330
London	6,110	6,330	6,535	6,295	7,005	7,040	7,795	7,935	8,345	8,630	9,965	10,800	11,250	11,380
Sunderland	6,390	6,610	6,975	6,575	7,285	7,250	7,986	8,135	8,625	8,815	10,105	11,090	11,420	11,560

**V.—CHINA, JAPAN, ETC. (via SUEZ).**

	Saigon.	Hong Kong.	Shanghai.	Nagasaki.	Yokohama.	Yokohama.*	Puji Island.	Manila.	Brisbane (via Torres Strait).	Sydney (N.S.W.).	Auckland (N.Z.).	Wellington (N.Z.).	Honolulu.	San Francisco.
Cardiff	8,805	9,718	10,470	10,595	11,065	11,250	11,540	9,470	11,788	11,520	12,400	12,420	13,150	13,490
Glasgow	9,020	9,815	10,712	10,819	11,280	11,414	11,755	9,814	12,028	11,764	12,655	12,660	13,365	13,705
Liverpool	8,910	9,856	10,665	10,700	11,170	11,355	11,645	9,575	11,924	11,600	12,545	12,560	13,955	13,795
London	8,985	9,900	10,650	10,775	11,245	11,430	11,720	9,750	11,961	11,708	12,625	12,612	14,010	13,800
Sunderland	9,265	10,060	10,820	11,055	11,525	11,710	12,000	9,930	12,152	11,900	12,790	12,850	14,220	13,950

\* Via Nagasaki.

**VI.—AMERICA.**

	Quebec.	Halifax, N.B.	New York.	Boston.	Jamaica.	New Orleans.	Panama.	Colon.	Panama.	Bahia.	Rio de Janeiro.	Montevideo.	Buenos Aires.	Valparaiso.
Cardiff	2,750	2,505	3,065	2,782	4,030	4,510	4,527	4,487	3,950	4,375	5,020	5,990	6,100	8,690
Glasgow	2,618	2,390	3,280	3,065	4,245	4,725	4,665	4,625	4,165	4,540	5,235	6,205	6,315	8,905
Liverpool	2,655	2,455	3,052	2,805	4,135	4,615	4,570	4,530	4,055	4,430	5,125	6,095	6,205	8,796
London	3,072	2,685	3,245	3,030	4,210	4,790	4,782	4,742	4,100	4,505	5,200	6,370	6,280	8,796
Sunderland	3,240	2,865	3,450	2,803	4,490	4,970	4,975	4,935	4,410	4,785	5,480	6,450	6,560	9,250

**PROFILES OF  
BRITISH AND FOREIGN WARSHIPS**



## CAPITAL SHIPS.

[In order to facilitate identification, the ships are arranged in accordance with the number of funnels and masts, as these are the features most easily distinguished at a distance. Dimensions and particulars of British and foreign warships will be found on pp. 227-297. All the profiles are drawn to the scale  $\frac{1}{4}$  in. = 100 ft.]

[Indexes to the names of vessels of which profiles are included in this section are given at the end of the volume.]



FRANCE. Battleships. Condorcet, Diderot, Voltaire.



SWEDEN. Battleship. Oscar II.



GREAT BRITAIN. Battle-cruiser. Hood.



GREAT BRITAIN. Battle-cruisers. Renown, Repulse.



**JAPAN. Battleships. Mutsu, Nagato.**

Displacement 23,000 tons.  
Length 260 ft.  
Beam 35 ft.  
Speed 21 knots.



**JAPAN. Battleships. Ise, Hyuga.**



**JAPAN. Battleships. Fuso, Yamashiro.**



**JAPAN. Battleships. Haruna, Kirishima, Kongo.**



**CHILE. Battleship. Almirante Latorre.**

Modernised 1931—mainmast raised and bridge work altered.

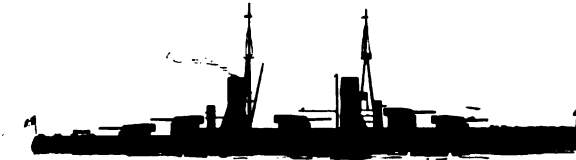




UNITED STATES. Battleships. California, Colorado, Maryland. Tennessee, West Virginia.



ITALY. Battleships. Andrea Doria, Carlo Duilio.



ITALY. Battleships. Conte di Cavour, Giulio Cesare.



UNITED STATES. Battleship. Arkansas.



ARGENTINE. Battleships. Moreno, Rivadavia.



FRANCE. Battleships. Bretagne, Lorraine, Provence.  
(Provence has a tall maintopmast)



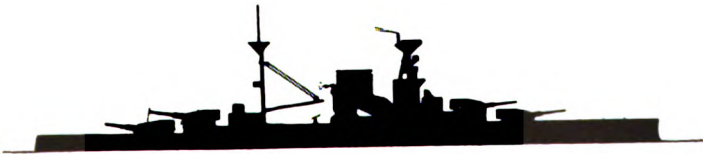
FRANCE. Battleships. Courbet, Jean Bart, Paris.



BRAZIL. Battleships. Minas Geraes, São Paulo.



GREAT BRITAIN. Battleships. Nelson, Rodney.



GREAT BRITAIN. Battleships. Queen Elizabeth, Warspite, Barham, Valiant, Malaya.



UNITED STATES. Battleships. New York, Texas.



**GREAT BRITAIN. Battleships. Ramillies, Resolution, Revenge, Royal Oak, Royal Sovereign.**



**UNITED STATES. Battleships. Idaho, Mississippi, New Mexico.**  
(Before modernisation. Now being modernised on same general lines as Arizona and Pennsylvania.)



**UNITED STATES. Battleships. Arizona, Pennsylvania.**



**UNITED STATES. Battleships. Nevada, Oklahoma.**



**SPAIN. Battleship. Jaime I.**



**GERMANY. Battleship. Deutschland.**

## AIRCRAFT CARRIERS AND TENDERS.



**GREAT BRITAIN. Aircraft Carrier. Eagle.**



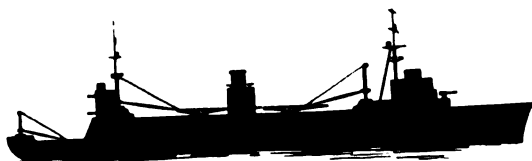
**SWEDEN. Aircraft Cruiser. Gotland.**



**GREAT BRITAIN. Aircraft Carrier. Hermes.**



**FRANCE. Aircraft Carrier. Béarn.**



**FRANCE. Seaplane Carrier. Commandant Teste.**



**ROYAL AUSTRALIAN NAVY. Seaplane Carrier. Albatross.**



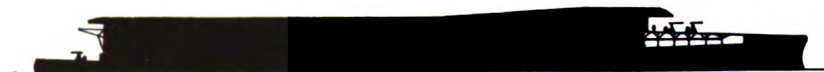
UNITED STATES. Aircraft Carriers. Saratoga, Lexington.



GREAT BRITAIN. Aircraft Carriers. Courageous, Glorious.



JAPAN. Aircraft Carrier. Hosho.



GREAT BRITAIN. Aircraft Carrier. Furious.

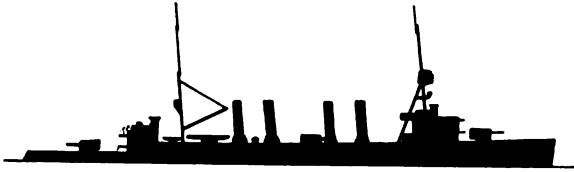


JAPAN. Aircraft Carrier. Akagi.

## CRUISERS.

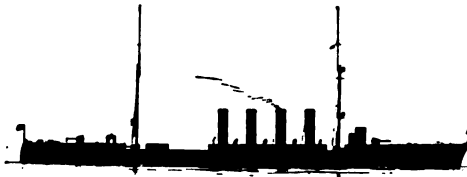


**JAPAN. Cruisers. Naka, Sendai, Jintsu.**



**UNITED STATES. Light Cruisers. Cincinnati, Concord, Detroit, Marblehead, Memphis, Milwaukee, Omaha, Raleigh, Richmond, Trenton.**

(There are small differences in the arrangement of guns aft.)



**JAPAN. Cruisers. Hirado, Yahagi.**



**ROYAL AUSTRALIAN NAVY. Cruiser. Adelaide.**



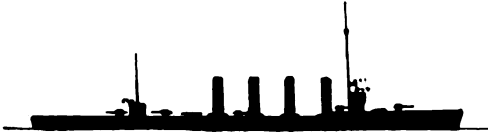
**ITALY. Armoured Cruisers. San Giorgio, San Marco.**



**FRANCE. Light Cruiser. Mulhouse (ex-German Stralsund).**



**ITALY.** Light Cruiser. *Taranto* (*ex-German Strassburg*).



**FRANCE.** Light Cruiser. *Thionville* (*ex-Austrian Novara*). Italian cruisers *Brindisi* (*ex-Austrian Helgoland*) and *Venezia* (*ex-Austrian S. Salda*) are practically similar.



**GREAT BRITAIN.** Cruisers. *Devonshire*, *Dorsetshire*, *London*, *Norfolk*, *Shropshire*, *Sussex*.



**GREAT BRITAIN.** Cruisers. *Berwick*, *Cornwall*, *Cumberland*, *Kent*, *Suffolk*.  
**COMMONWEALTH OF AUSTRALIA.** Cruisers. *Australia*, *Canberra*.



**GREAT BRITAIN.** Cruisers. *Emerald*, *Enterprise*.  
(In *Enterprise* the forward 6-in. guns are in a twin mounting on the forecastle deck.)



**JAPAN.** Light Cruisers. *Kiso*, *Kitakami*, *Kuma*, *O-I*, *Tama*, *Isuzu*,  
\**Natori*, \**Nagara*, \**Yura*, \**Kinu*, \**Abukuma*.  
• Has aircraft hangar incorporated in bridge structure.





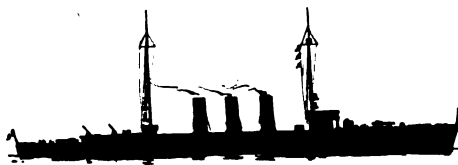
FRANCE. Light Cruiser. Metz (*ex-German Königsberg*).



JAPAN. Light Cruisers. Tatsuta, Tenryu.



SPAIN. Light Cruiser. Mendez Nuez.



FRANCE. Light Cruiser. Strasbourg (*ex-German Rensburg*).



SPAIN. Light Cruiser. Republica.



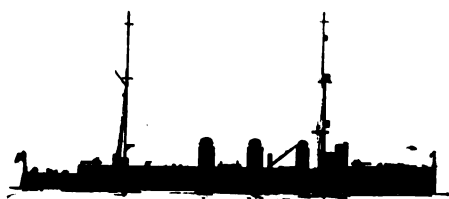
ITALY. Light Cruiser. Ancona (*ex-German Graudenz*).



ITALY. Light Cruiser. Bari (ex-German Pillau).



GREAT BRITAIN. Light Cruiser. Comus.



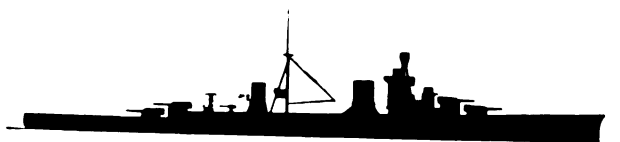
ITALY. Scout Cruiser. Quarto.



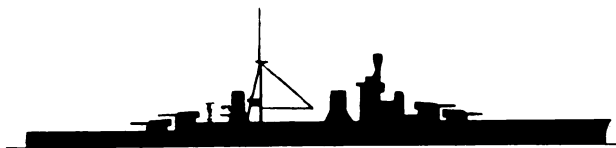
JAPAN. Second Class Cruiser. Tone. (On disposal list, 1931.)



JAPAN. Cruisers. Nachi, Myoko, Ashigara, Haguro, Atago, Takao, Chokai, Maya.



ITALY. Cruiser. Bolzano.



ITALY. Cruisers. Pola, Zara, Fiume, Gorizia.



JAPAN. Cruisers. Furutaka, Kako.



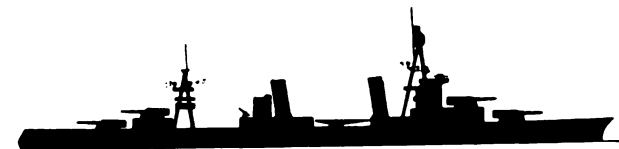
JAPAN. Cruisers. Aoba, Kinugasa.



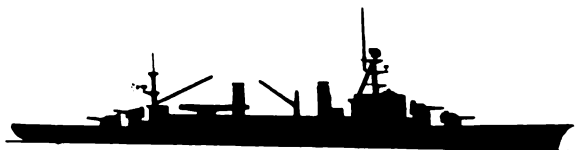
GREAT BRITAIN. Cruisers. Effingham, Frobisher, Hawkins, Vindictive.  
(In Vindictive the raised 7.5-in. gun forward is removed and a catapult and  
hanger mounted forward of the bridge).



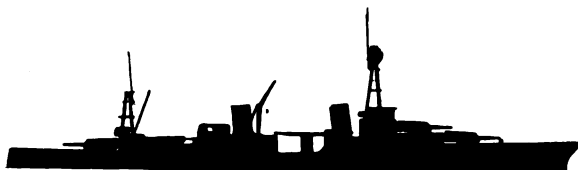
FRANCE. Cruisers. Duquesne, Tourville, Suffren, Colbert, Foch, Duplex.  
(Colbert, Duplex and Foch have the catapults between the funnels. Foch  
and Colbert have tripod mainmasts.)



UNITED STATES. Cruisers. Salt Lake City. Pensacola.



FRANCE. Training Cruiser. *Jeanne d'Arc*.



UNITED STATES. Cruisers. *Northampton*, *Chester*, *Louisville*, *Chicago*, *Houston*, *Augusta*.



GREAT BRITAIN. Cruiser. *York*.  
*Exeter* is similar, but funnels and masts are vertical.



GERMANY. Light Cruisers. *K6in*, *Karlsruhe*, *Königsberg*.



ITALY. Cruisers. *Alberico de Barbiano*, *Alberto di Giussano*, *Bartolomeo Colleoni*, *Giovanni della Bande Nera*.



GREAT BRITAIN. Cruiser Minelayer. *Adventure*.



NETHERLANDS. Cruisers. Java, Sumatra.



ITALY. Cruisers. Trento, Trieste.



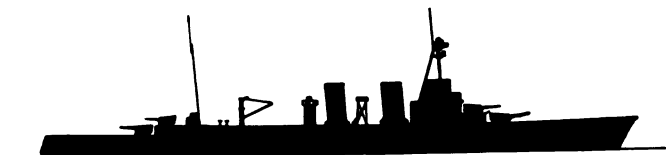
SPAIN. Light Cruisers. Libertad, Almirante Cervera, Miguel de Cervantes.



GERMANY. Light Cruiser. Emden.



FRANCE. Cruiser Minelayer. Pluton.



FRANCE. Cruisers. La Motte Piquet, Duguay-Trouin, Primauguet.



**GREAT BRITAIN.** Light Cruisers. Danae, Dauntless, Dragon.



**GREAT BRITAIN.** Light Cruisers. Delhi, Dunedin, Diomedé, Despatch, Durban.



**GREAT BRITAIN.** Light Cruisers. Cardiff, Ceres, Coventry, Curacoa, Curlew.



**GREAT BRITAIN.** Light Cruisers. Cairo, Calcutta, Capetown, Carlisle, Colombo.



**GREAT BRITAIN.** Light Cruisers. Caledon, Calypso, Caradoc, Concord.



**GREAT BRITAIN.** Light Cruisers. Cambrian, Canterbury, Castor, Constance, Champion.



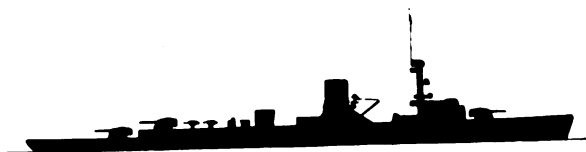
**GREECE.** Cruiser. Helle.



**SWEDEN. Armoured Cruisers. Gustav V, Sverige.**  
(Drottning Victoria at present has two funnels and a tripod mainmast,  
but is to be reconstructed and modernised as above.)



**FRANCE. Cruiser. Algérie.**



**GERMANY. Light Cruiser. Leipzig.**



**GREAT BRITAIN. Cruiser. Leander.**



**ARGENTINE. Cruisers. Almirante Brown, Vintecino de Malo.**



**JAPAN. Light Cruiser. Yubari.**



## FLOTILLA LEADERS AND DESTROYERS.

(See pp. 273-297.)



**FRANCE.** Flotilla Leaders. Bison, Guépard, Lion, Vauban, Valmy, Verdun, Vauquelin, Kersaint, Cassard, Tarter, Maillé Brézé, Chevalier-Paul.



**JAPAN.** 1st Class Destroyers. Amatsukaze, Tokisukaze, Isokaze, Hamakaze.



**FRANCE.** Flotilla Leaders. Jaguar, Panthère, Leopard, Lynx, Chacal, Tigre.



**FRANCE.** Destroyers. Bourrasque, Orage, Ouragan, Simoun, Cyclone, Mistral, Sirocco, Tempête, Tramontane, Typhon, Trombe, Tornade.



**UNITED STATES.** Destroyers. Aylwin, Balch, Benham, Duncan, Parker, Cassin, Armerings, Downe.



**UNITED STATES.** Torpedo Boat Destroyer, Caldwell.



**UNITED STATES.** Destroyers. Clemson and others.



**FRANCE.** Torpedo Boat Destroyers. Algérie, Annamite, Arabe, Bambara, Hova, Kabyle, Marocain, Sakalava, Sénégalais, Somali, Tonkinois, Touareg.



**FRANCE.** Destroyers. Aventurier, Téméraire, Opiniâtre.



**ITALY.** Destroyers. Angelo Bassini, E. Cosenz, Francesco Stocco, Giacinto Carini, Giacomo Medici, Giovanni Acerbi, Giuseppe la Farina, Giuseppe la Masa, Giuseppe Sirtori, Nicola, Fabrizi, Vincenzo Orsini.



**FRANCE.** Destroyers. Enseigne Roux, Mécanicien Principal Lestin.



**YUGO SLAVIA.** Flotilla Leader. Dubrovnik.



**FRANCE.** Torpedo Boat Destroyer. Bouclier.



**JAPAN.** 1st Class Destroyers. Fubuki and class.



**ITALY.** Flotilla Leaders (Scouts). Nicoloso Da Recco and class. (12 vessels.)



**ITALY.** Flotilla Leaders (Scouts). Leone, Pantora, Tigre.



**JAPAN.** 1st Class Destroyers. Minadzuki and class (12 ships), and Yunagi and class (9 ships).



**GERMANY.** Destroyers. Ilia, Wolf, Tiger, Luchs, Jaguar, Leopard, Seeadler, Greif, Albatros, Kondor, Falke, Möwe.



**GREAT BRITAIN.** Flotilla Leader. Codrington.



**GREAT BRITAIN.** Destroyers. "Acasta," "Beagle," "Crusader" and "Defender" classes.

Flotilla Leaders. Keith, Duncan and Kempenfelt.



**ITALY.** Flotilla Leaders (Scouts). Carlo Mirabello, Augusto Riboty.



**GREAT BRITAIN.** Flotilla Leaders. Broke, Keppel, Shakespeare, Spencer, Wallace, Bruce, Douglas, Campbell, Mackay, Malcolm, Montrose, Stuart.



**HOLLAND.** Destroyers. De Ruyter, Evertsen, Piet Hein, Kortenaer, Banckert, Van Nes, Van Galen, Witte de With.



**GREAT BRITAIN.** Destroyers. Vansittart, Venomous, Verity, Volunteer, Wanderer, Veteran.



**GREAT BRITAIN.** Destroyers. Vanessa, Vanity, Vanoc, Vanquisher, Vectis, Vega, Velox, Vendetta, Venetia, Venturous, Verdun, Versatile, Vesper, Vidette, Vimiera, Violent, Vivacious, Vivien, Vimy (*late Vancouver*), Vortigern, Valhalla, Valentine, Valkyrie, Valorous, Vampire, Viceroy, Viscount, Voyager, Wakeful, Walker, Walpole, Walrus, Warwick, Watchman, Waterhen, Wessex, Westcott, Westminster, Whirlwind, Whitley, Winchelsea, Winchester, Wolfhound, Wolsey, Woolston, Wrestler, Wryneck.



**GREAT BRITAIN.** Destroyers. Whitehall, Whitshed, Wildswan, Witherington, Wivern, Wolverine, Worcester, Wishart, Witch.



**GREAT BRITAIN.** Destroyers. Ambuscade, Amazon.



**CHILE.** Destroyers. Serrano, Orella, Riquelme, Hyatt, Videla, Aldea.



**SWEDEN.** Destroyers. *Klas Horn, Klas Uggla, Nils Ehrensköld, O.H. Nordenskjöld.*



**ITALY.** Destroyers. *Palestro, Solferino, San Martino, Confinza.*



**JAPAN.** 2nd Class Destroyers. *Kuwa, Tsubaki, Maki, Keyaki, Yanagi, Kashi, Hinoki.*



**ITALY.** Destroyers. *Turbine. Niembo, Euro, Boreo, Espero, Ostro, Zefforo, Aquilone, N. Sauro, F. Nullo, D. Marin, C. Battisti.*



**ITALY.** Destroyers. *Q-Sella, B. Ricasoli, F. Crispi, G. Nicotera.*



**DENMARK.** Torpedo Boats (1st Class). *Glentini, Hogen, Ornen, Laxen, Dragen, Hvalen.*



**ITALY.** Destroyers. *Alessandro Poerio and Guglielmo Pepe.*



**ITALY.** Destroyers. *Dardo, Freccia, Strale, Saetta, Folgore, Lampo, Baleno, Fulmine.*



**GREAT BRITAIN.** Destroyers. *Admiralty "S" class.*



**GREECE.** Destroyers. *Hydra, Spetzai, Psara and Countouriotis.*



PLANS  
**OF**  
BRITISH AND FOREIGN WARSHIPS.

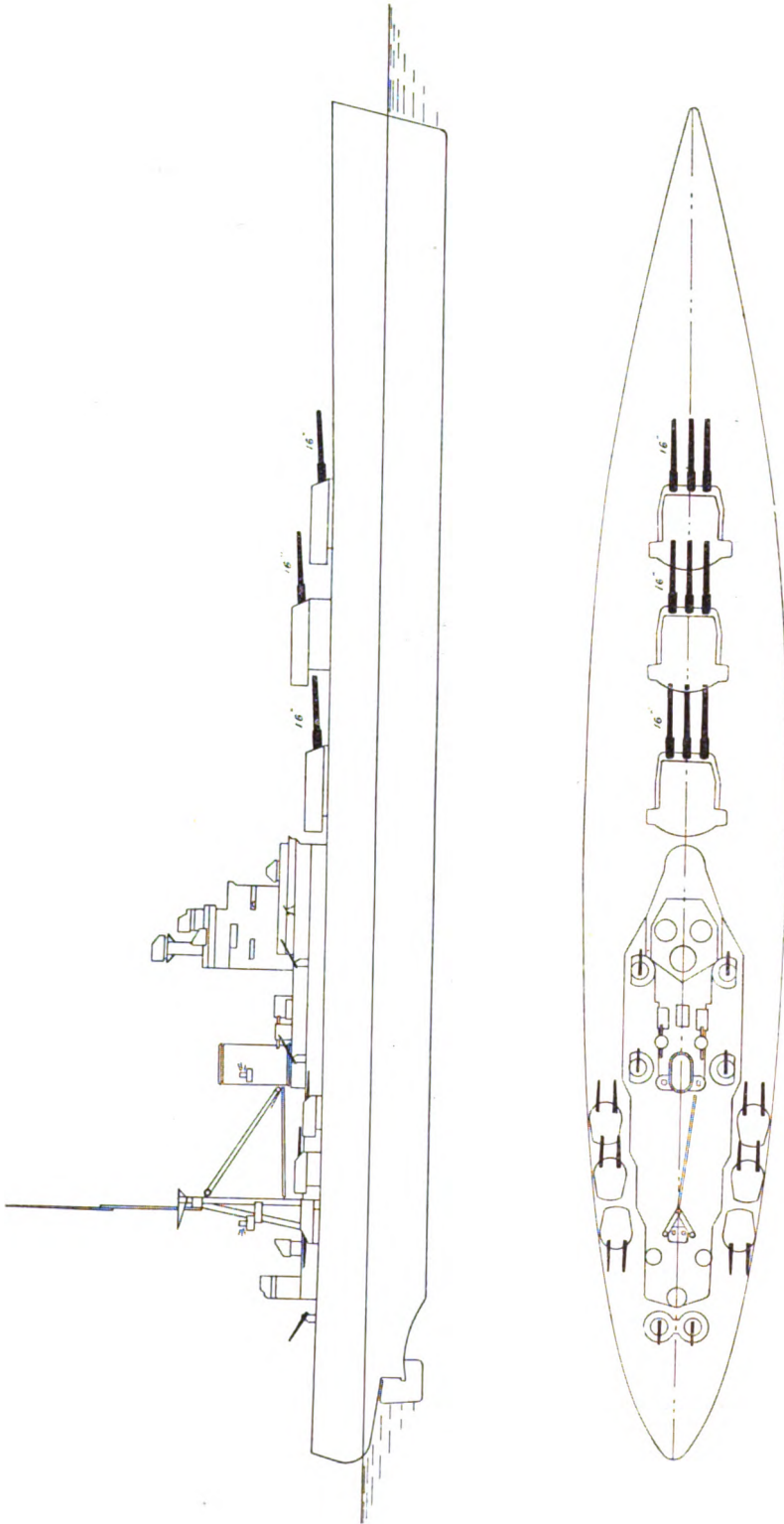


GREAT BRITAIN.

BATTLESHIPS.

Nelson.

Rodney.



Length (extreme), 710 ft. ; Rodney, 33,500 tons ; Nelson, 33,900 tons ; Speed, 23 knots.  
Armament, 9-16-in. ; 12-6-in. ; 6-4.7-in. A.A. ; 4-3-pr. ; 6-2-pr. Pom Poms ; 11 L. ; 5 M. ; 2 torpedo tubes.





## GREAT BRITAIN.

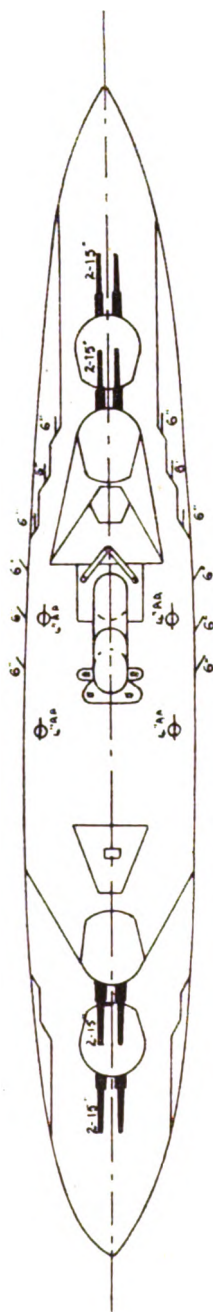
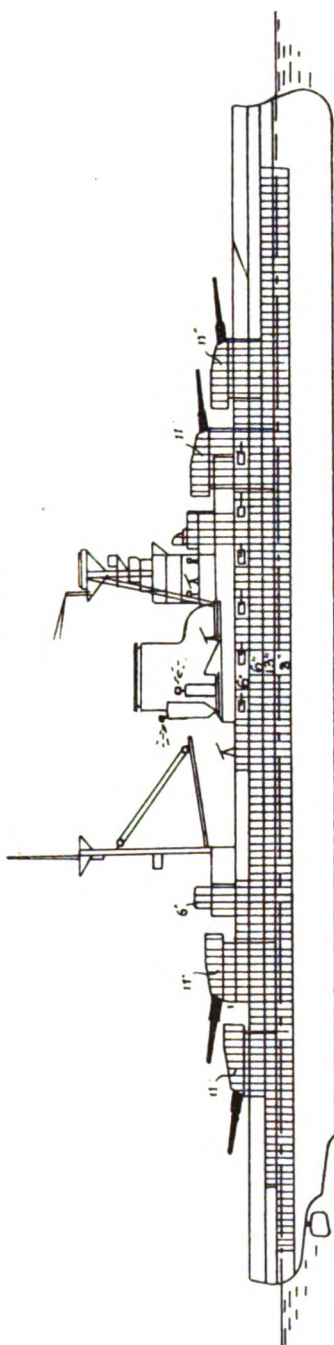
## BATTLESHIPS.

Queen Elizabeth.

Warspite.    Barham.  
(As reconstructed 1926-31.)

Valiant.

Malaya.

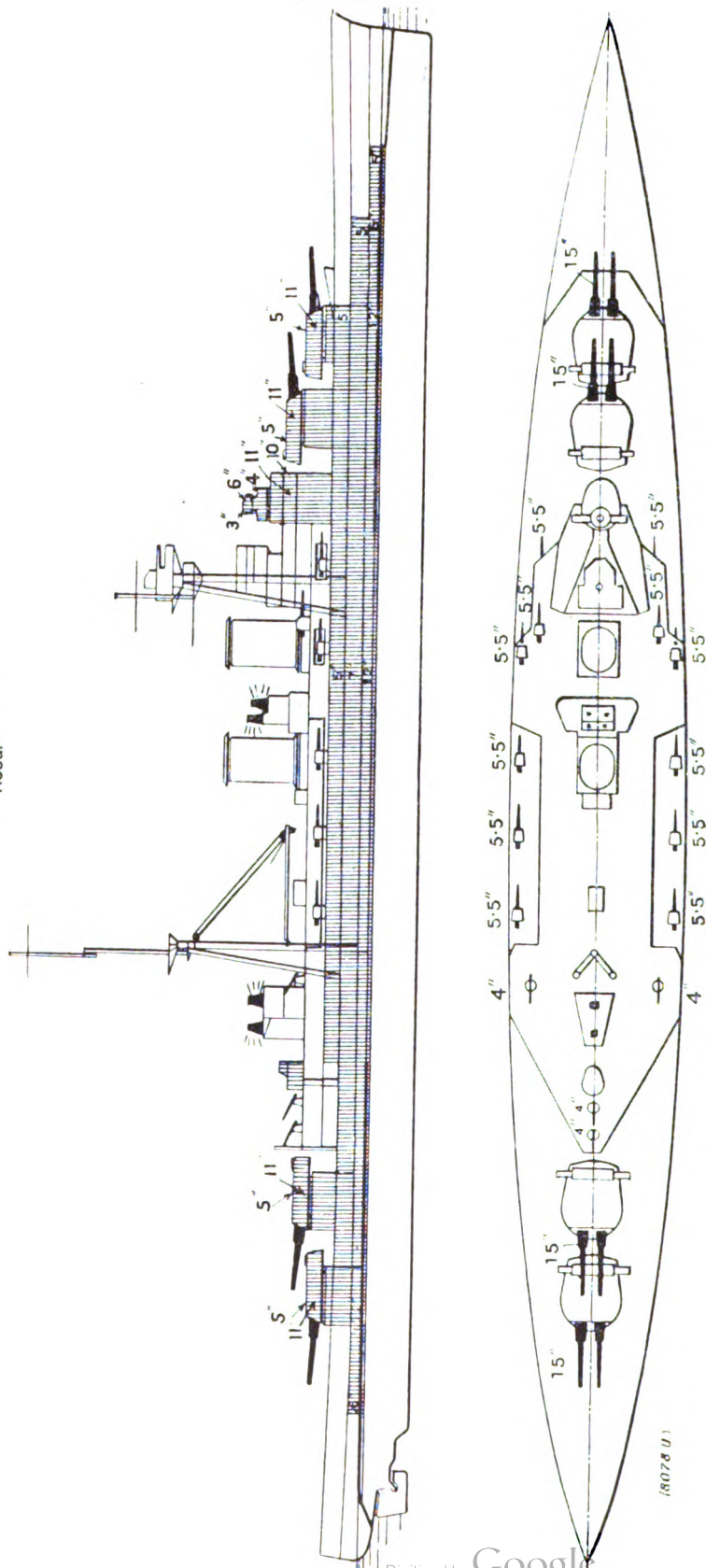


Length R.P., 600 ft.; 31,100 tons; Speed, 25 knots; Completed, 1915-1916.  
Armament, 8-15-in.; 12-6-in. A.A.; 4-3-pr.; 5 M.; 11 L.; 2 torpedo tubes.

GREAT BRITAIN.

**BATTLE-CRUISER.**

**Hood.**



Length (extreme), 860 ft. 10 ins.; Length B.P., 810 ft.; 42,100 tons; Speed, 31\* knots; Completed, 1920. Armament, 8-15-in.; 12-5.5-in.; 4-4-in. A.A.; 4-3-pdr.; 6 M.; 10 L.; 4 A.W. and 2 sub. torpedo tubes.

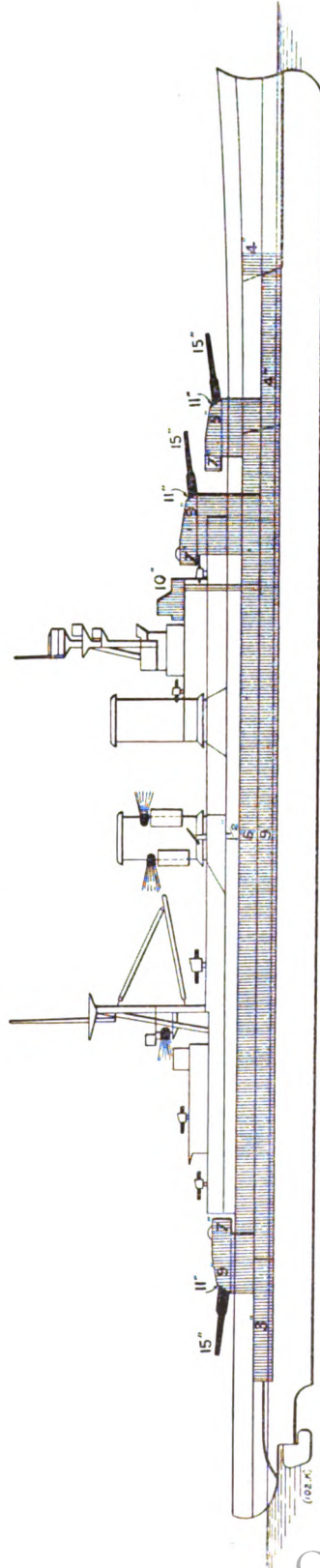
\* Trials at 44,600 tons, 31.89 knots with 151,000 S.H.P.

GREAT BRITAIN.

BATTLE-CRUISERS.

Repulse.

Renown



Length (extreme), 794 ft. 2 ins. ; Length B.P., 750 ft. ; 32,000 tons ; Speed, 31.5 knots ; Completed, 1916.

Armament, 6—15-in. ; 15—4-in. ; 4—3-pr. ; 4—4-in. A.A. ; 5 M. ; 10 L. ; 2 submerged torpedo tubes (Repulse, 8 a.w. in addition).

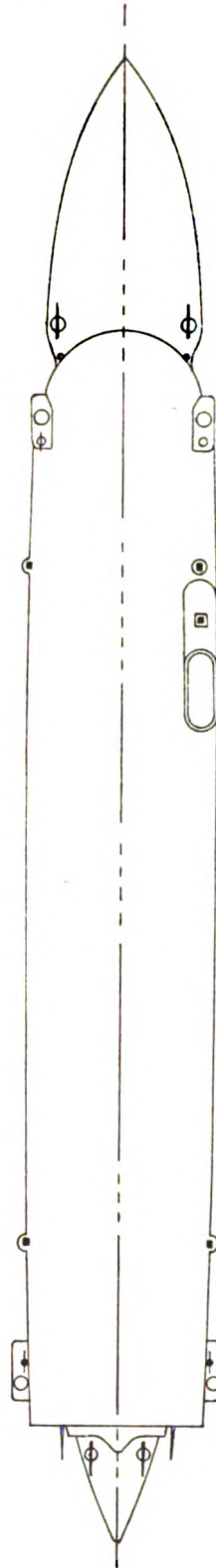
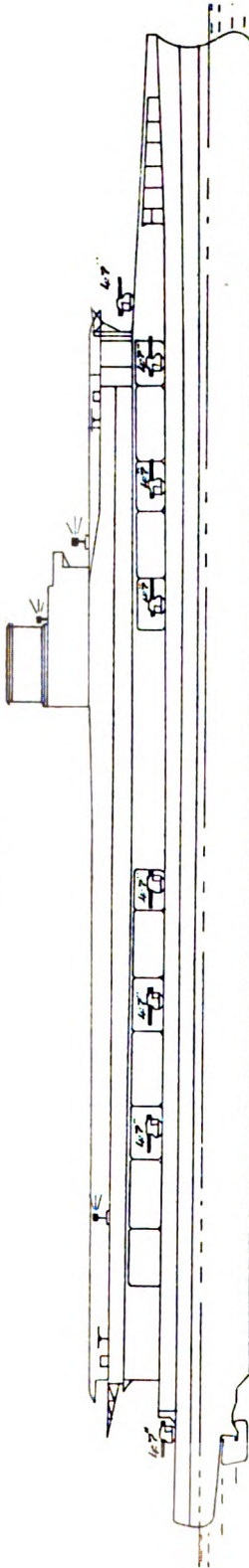
NOTE.—Repulse originally had a 6-in. main belt, but was re-armoured in 1920-21. Re-armouring of the Renown was completed during 1926.

GREAT BRITAIN

AIRCRAFT CARRIERS.

Courageous.

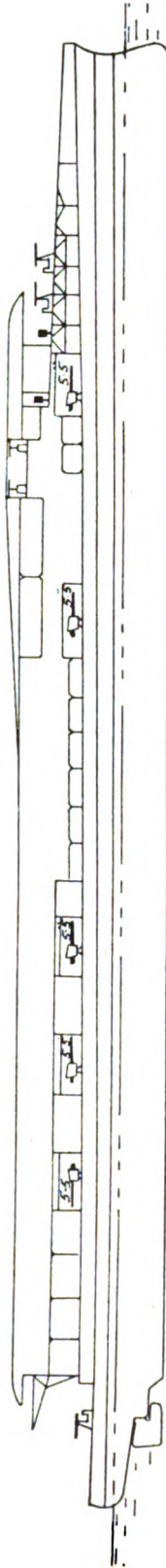
Glorious.



Length (extreme), 786 ft. 6 ins. ; 22,500 tons ; Speed, 30½ knots.  
Armament, 16—4.7-in. ; 4—3-pr. ; 4—2-pr. ; 4 M. ; 42 L.



GREAT BRITAIN  
AIRCRAFT CARRIER.  
Furious.

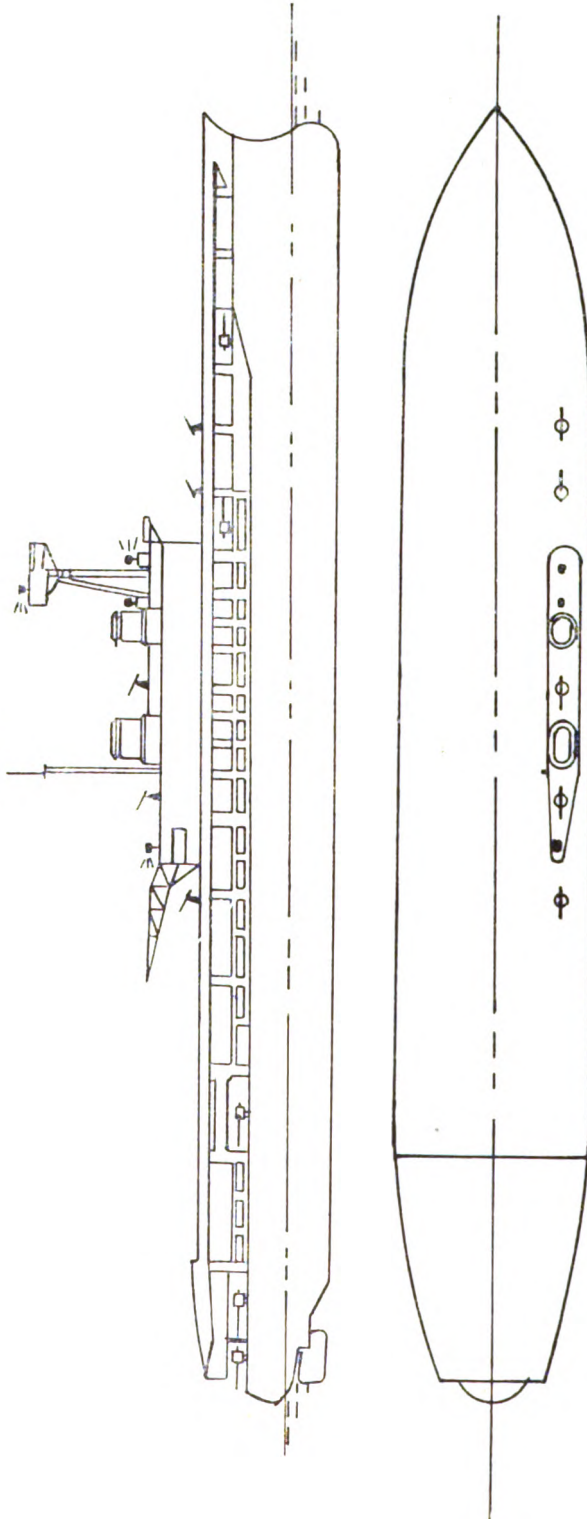


Length (extreme), 786 ft. 6 ins. ; 22,450 tons ; Speed, 31 knots ; Completed as a cruiser, 1917 ; Conversion to aircraft carrier completed 1925.  
Armament, 10—5.6-in. ; 3—4-in. A.A. ; 4—3-pr. ; 4—2-pr. ; 46 smaller.

GREAT BRITAIN.

AIRCRAFT CARRIER.

Eagle.

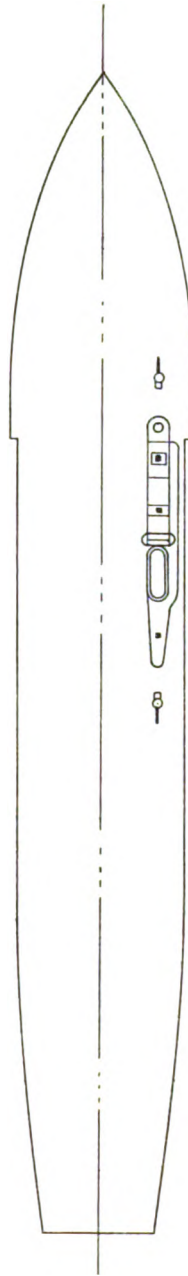
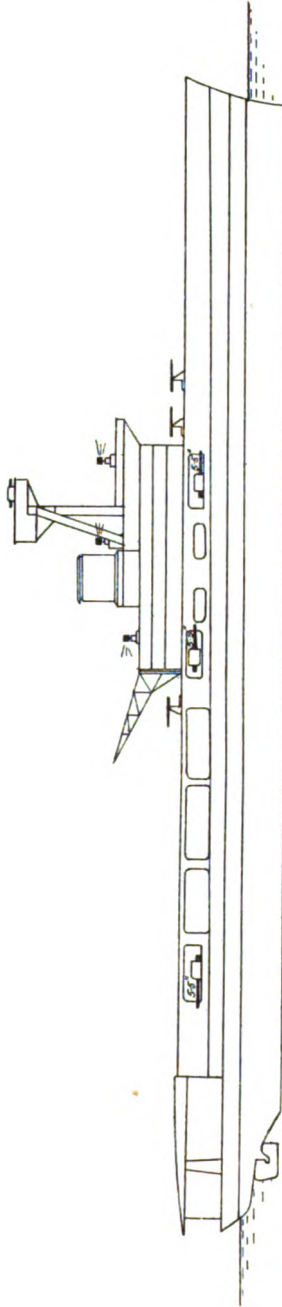


Length (extreme), 667 ft. 6 ins. ; 22,600 tons ; Speed, 24 knots ; Completed as an aircraft carrier, 1924.  
Armament, 9-6-in. ; 5-4-in. A.A. ; 4-3-pr. ; 32 smaller.



GREAT BRITAIN.  
AIRCRAFT CARRIER,

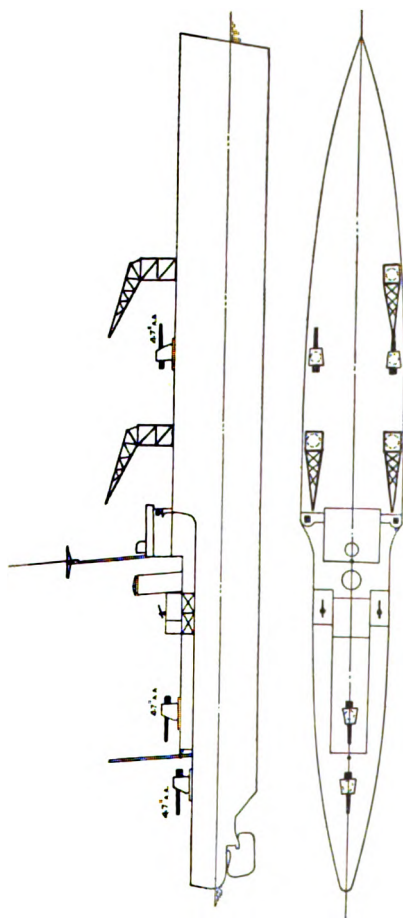
Hermes.



Length (extreme), 599 ft. 6 ins. ; 10,850 tons ; Speed, 25 knots ; Completed 1924.

Armament, 6—5·5-in. ; 3—4-in. A.A. ; 4—3-pr. ; 2—2-pr. ; 4 M. ; 16 L.

ROYAL AUSTRALIAN NAVY.  
SEAPLANE CARRIER.  
*Albatross.*



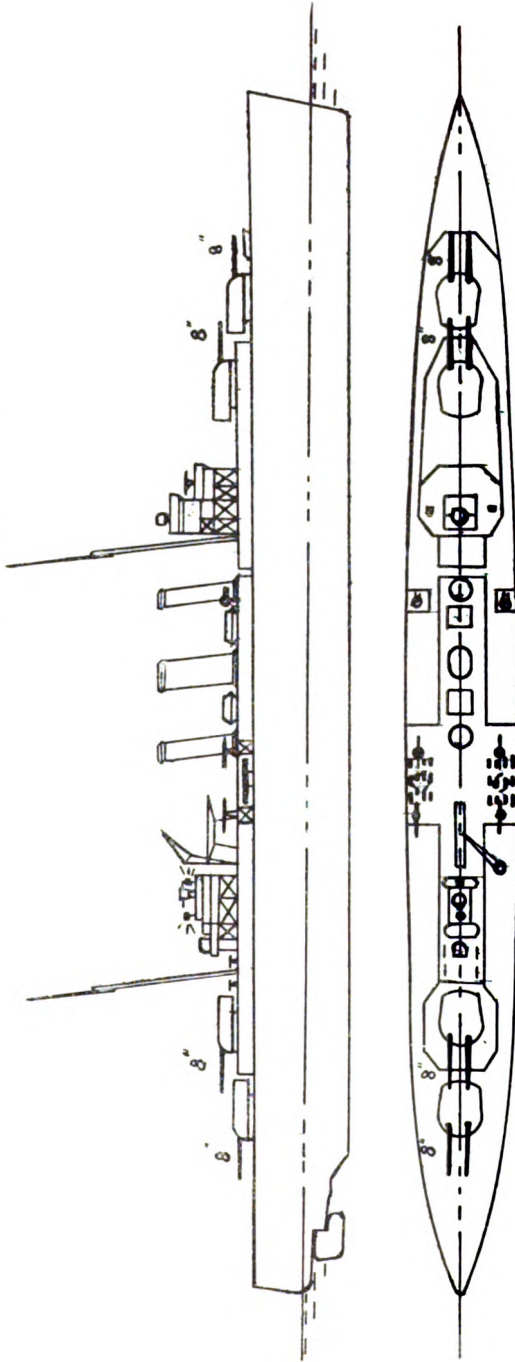
Length, 443½ ft.; 4,800 tons; Speed, 21 knots; Completed 1929.

Armament, 4—4 7-in. A.A.; 4—2-pdr. Pom Poms; 4—3-pdr.; 4 M.; 4 L.; 6 seaplanes.

GREAT BRITAIN.

CRUISERS.

London. Sussex. Shropshire. Devonshire. Dorsetshire\* Norfolk.\*



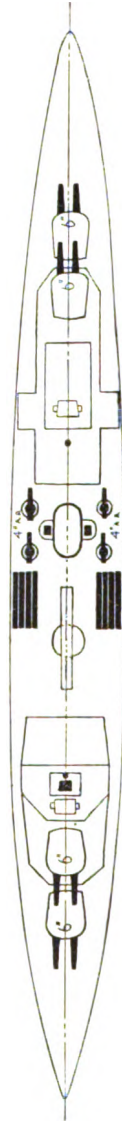
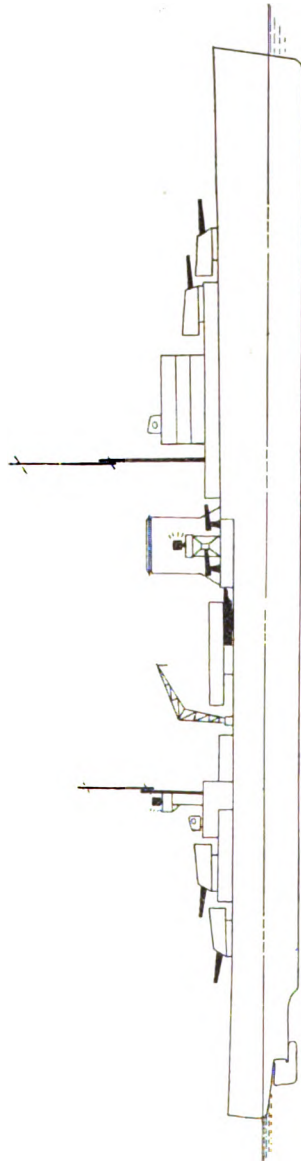
Displacement, 10,000 tons ; Length (extreme), 630 ft. Armament, 8—8-in. ; 4—4-in. A.A. ; 4—3-pr. ; 4 M. ; S L. ; 8 torpedo tubes.

\* In Dorsetshire and Norfolk the seaplane crane and the 4—4-in. guns are slightly forward of the positions shown.

GREAT BRITAIN

CRUISER.

Leander.

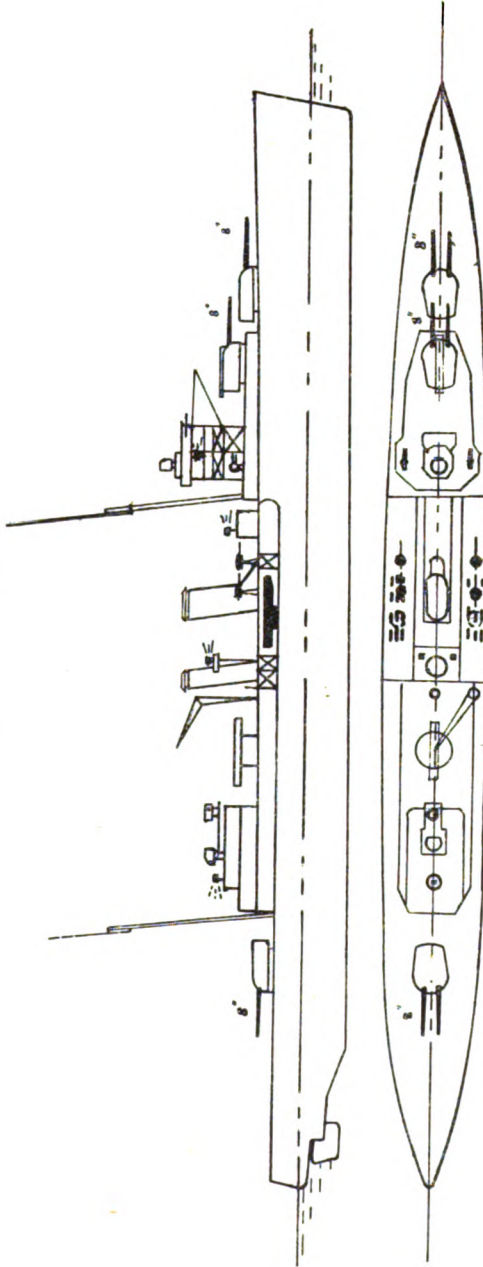


Displacement, 7,000 tons; Length, 547 ft. (on W.L.); Speed 32½ knots. Armament 8—6-in., 4—4-in. A.A.

## GREAT BRITAIN.

## CRUISERS.

York. Exeter.\*



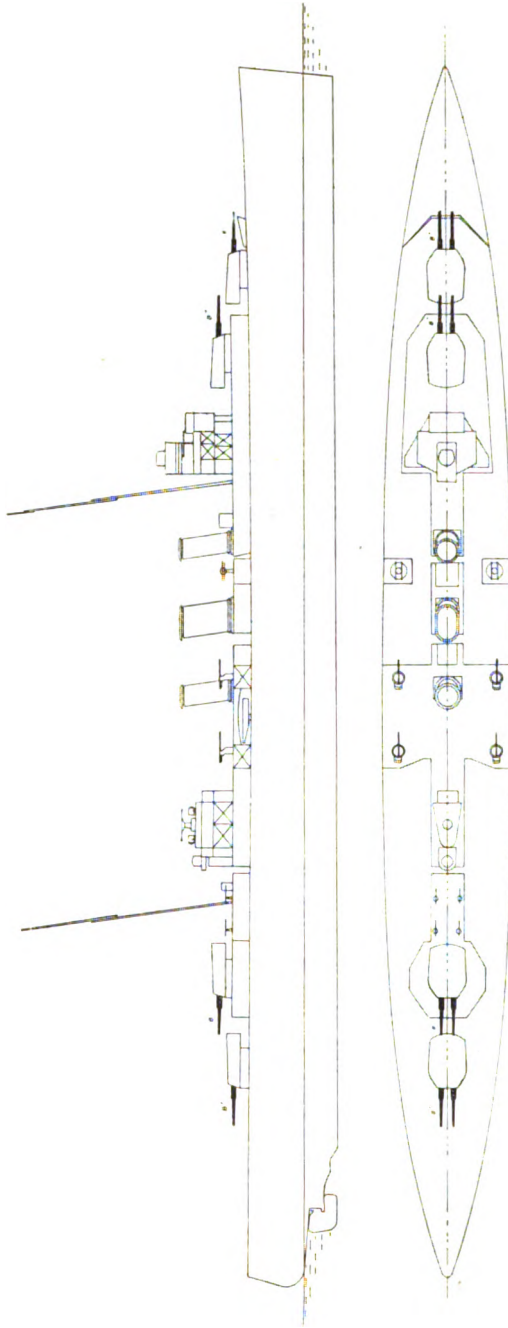
Displacement : York, 8,250 tons ; Exeter, 8,330 tons ; Length (extreme), 575 ft. Armament, 6—8-in. ; 4—4-in. A.A. ; 4—3-pr. ; 2—2-pr. ; 4 M ; 8 L ; 6 torpedo tubes.

\* In Exeter funnels and masts are vertical, and the mainmast is taken up through the superstructure.

## GREAT BRITAIN.

## CRUISERS.

Kent. Berwick. Cumberland. Suffolk. Cornwall. Australia\* Canberra\*



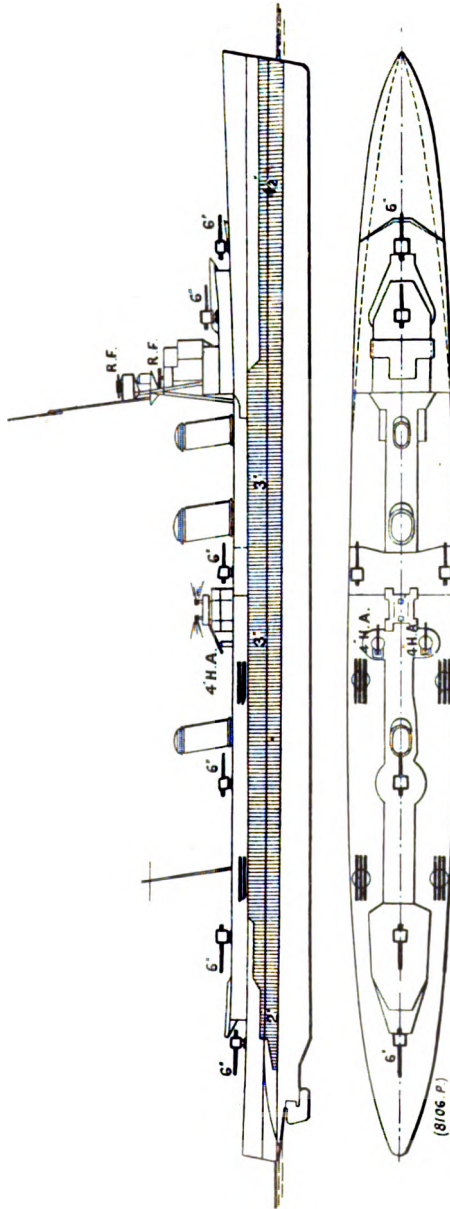
Length (extreme), 630 ft. ; B.P., 590 ft. ; 9,750 to 9,870 tons ; Speed, 31½ knots.  
 Armament, 8-8-in. ; 4-4-in. A.A. ; 4-3-pr. ; 4-2-pr. Pom Poms ; 4 M. ; 8 L. ; 2 Q.R. torpedo tubes.  
 \* H.M. Australian Navy.

## GREAT BRITAIN.

## LIGHT CRUISERS.

Emerald.

Enterprise.\*



Length (extreme), 570 ft. ; Length B.P., 535 ft. ; Emerald, 7,550 tons ; Enterprise, 7,580 tons ; Speed, 33 knots.  
 Armament, 7-6-in. ; 3-4-in. A.A. ; 4-3-pr. ; 2-2-pr. Pom Poms ; 2 M. ; 8 L. ; 16 torpedo tubes.

Correction to plan : The torpedo tubes are in quadruple sets.

\* In Enterprise the two forward 6-in. guns are mounted in a twin-mounting on fore-castle deck.




GREAT BRITAIN.

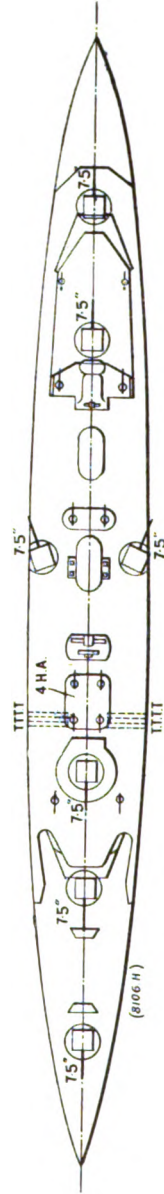
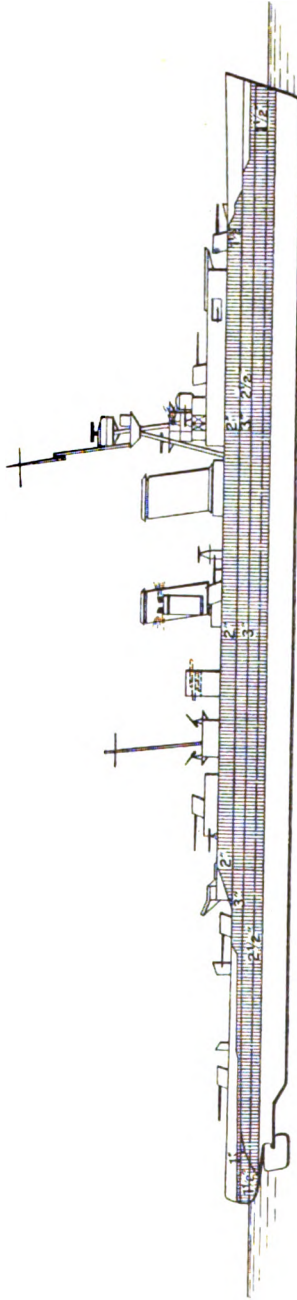
**LIGHT CRUISERS.**

Effingham.

• **Hawkins.**

**Frobisher.**

**Vindictive.** 



Length (extreme), 605 ft.; Length B.P., 565 ft.; 9,860 tons; Speed, 30 knots.

Length (extreme), 605 ft.; Length B.P., 565 ft.; 9,860 tons; Speed, 30 knots.  
Armament, 7-7.5-in.; 3-4-in. A.A.; 4-3-pr.; 2-2-pr.; 2 M. 81; 6 torpedo tubes.

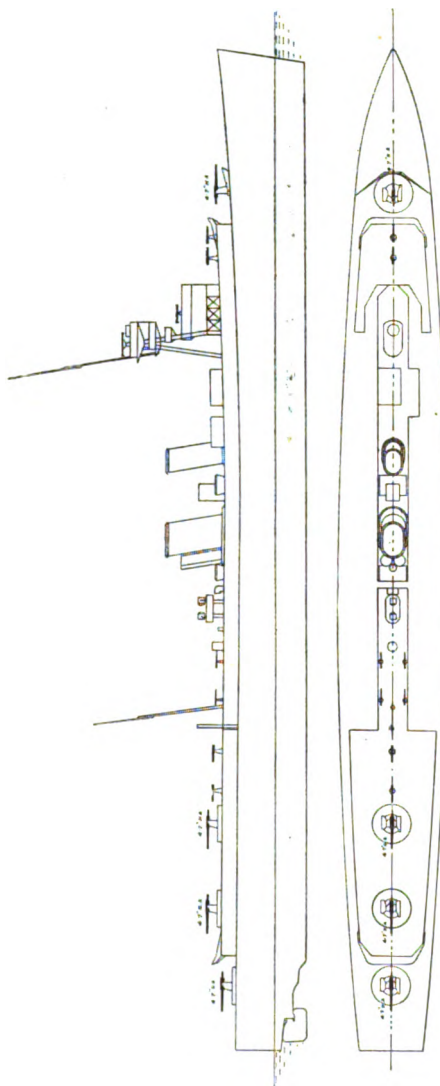
n., 3-4-in. A.A.; 4-3-pr.; 2-2-pr.; 2 M.; 8 L.; 6 torpedo tubes. Hawkins has 4-4-in. A.A. and 5 torpedo tubes.

- Vindictive has a catapult and hangar mounted forward of the bridge, and to accommodate this the raised 7.5-in. gun forward has been removed. Drawings has 4-9-in. A.A. and 5 torpedo tubes.

GREAT BRITAIN.

CRUISER MINELAYER.

Adventure.

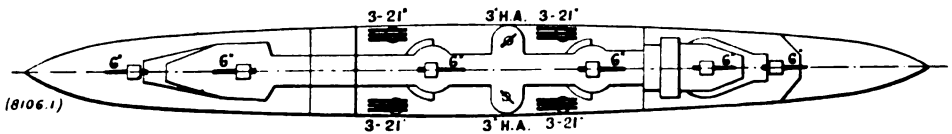
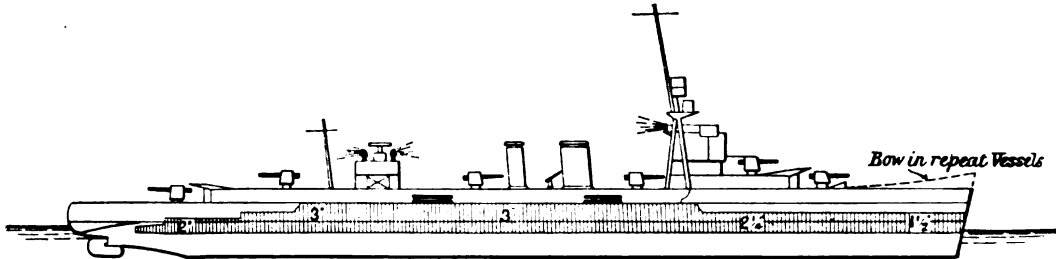


Length (extreme), 521 ft. ; Length, R.P., 500 ft. ; 6,740 tons ; Speed, 27½ knots.  
Armament, 4—4.7-in. A.A. ; 4—3-pr. ; 4—2-pr. ; 2 M. ; 8 L. ; 310 mines.

GREAT BRITAIN.

LIGHT CRUISERS. D CLASS.

\*Despatch.      \*Diomedé.      Danae.      Dauntless.      Dragon.      \*Delhi.  
                         \*Dunedin.      \*Durban.

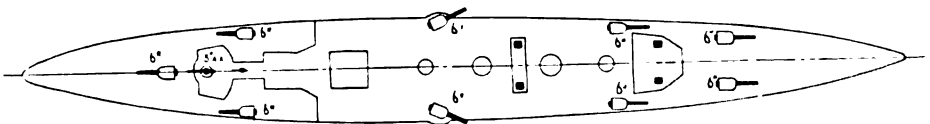
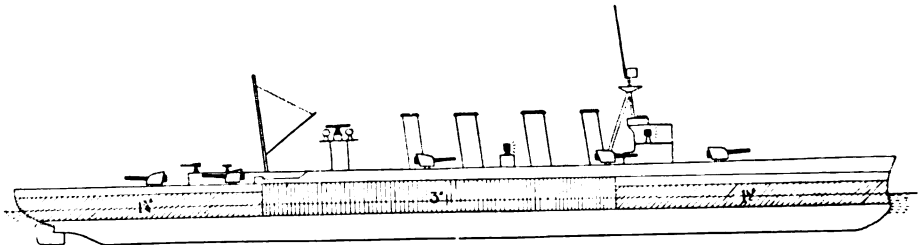


Length, 472½ ft. ; 4,850 tons ; Speed, 29 knots ;  
Armament, 6—6-in. ; 3—4-in. A.A. ; 4—3-pr., 2—2-pr. ; 2 M. ; 8 L.  
Diomedé and Dunedin are now attached to the New Zealand Division.  
• Repeat vessels.

ROYAL AUSTRALIAN NAVY.

CRUISER.

Adelaide.

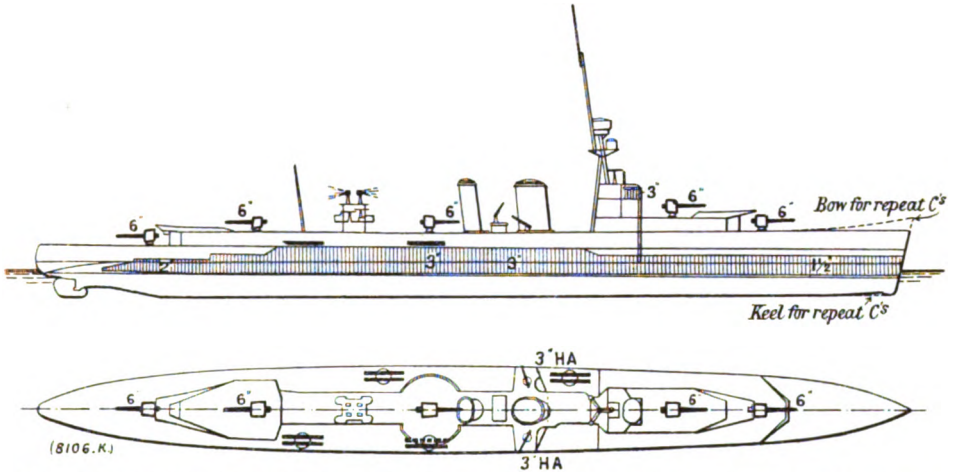


Length, 462½ ft. ; 5,100 tons ; 25 knots.  
Armament, 9—6-in. ; 4—3 pr. ; 1—3-in. A.A.

## GREAT BRITAIN.

## LIGHT CRUISERS.

Ceres. Curacao. Curlew. Cardiff. Coventry.  
 \*Cairo. \*Cape Town. \*Carlisle. \*Colombo. \*Calcutta.

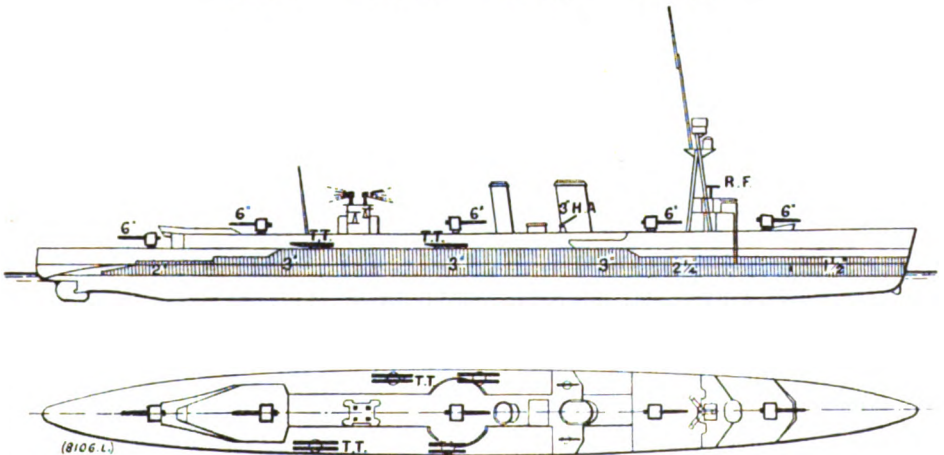


Length (extreme), 450 ft. (451 ft. 6 ins. Repeat Vessels); Length B.P., 425 ft.; 4,290 tons; Repeat vessels, 4,200 tons;  
 Speed, 29 knots; Completed, 1917-18 (Repeat Vessels, 1918-23).  
 Armament, 5—6-in.; 2—3-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 4 above-water D.R. torpedo tubes.  
 Cardiff and Ceres have 2—3-pr.

\* Repeat vessels.

## LIGHT CRUISERS.

Caledon. Calypso. Caradoc. Concord.



Caledon } Length (extreme), 450 ft.; Length B.P., 425 ft.; 4,180 tons; Speed, 29 knots; Completed, 1917.  
 Calypso } Armament, 5—6-in.; 2—3-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 2 M.; 8 L.; and 4 above-water D.R.  
 Caradoc } torpedo tubes.

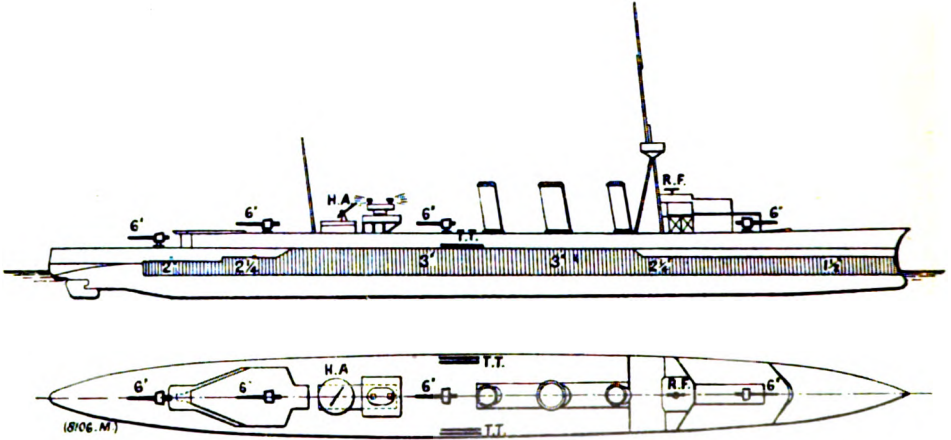
These Plans apply generally to Concord, but there are differences in detail, as stated below.

Concord { Length (extreme), 446 ft.; Length B.P., 420 ft.; 4,120 tons; Speed, 29 knots; Completed, 1916.  
 Armament, 3—6-in.; 2—3-in. A.A.; 2—3-pr.; 2—2-pr. Pom Poms; 2 M.; 8 L.; and 2 submerged torpedo  
 tubes.

## GREAT BRITAIN.

## LIGHT CRUISER.

Comus.



Length (extreme), 446 ft.; Length B.P., 420 ft.; 3,895 tons; Speed, 29 knots; Completed, 1915.  
 Armament, 4—6-in.; 2—3-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 1 M.; 8 L.; 2 above-water D.R. torpedo tubes.

## LIGHT CRUISERS

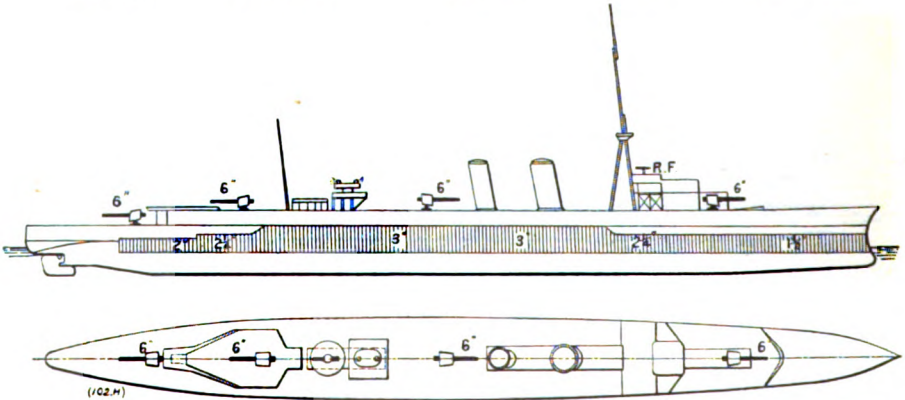
Cambrian.

Canterbury.

Constance.

Castor.

Champion.



Length (extreme), 446 ft. 6 ins.; Length B.P., 420 ft.; 3,920 tons; Speed, 29 knots; Completed, 1915.

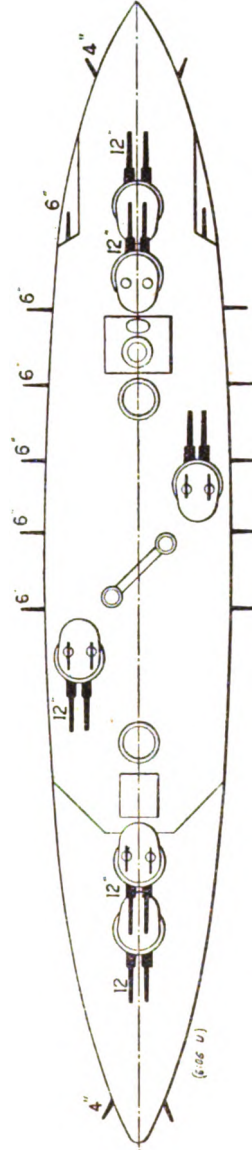
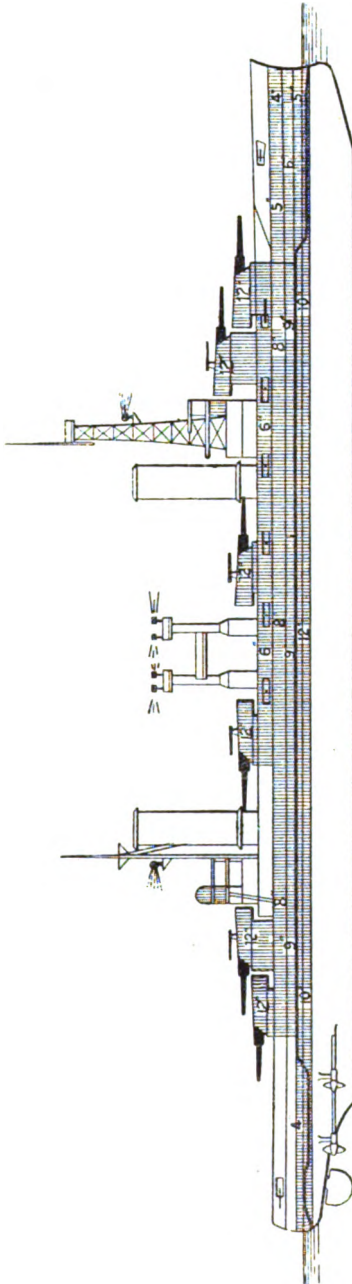
Cambrian	}	Armament, 4—6-in.; 2—3-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 1 M.; 8 L.; 2 submerged torpedo tubes.
Canterbury		
Constance		
Castor		
Champion		Armament, 4—6-in.; 1—3-in. A.A.; 2—2-pr. Pom Poms; 1 M.; 8 L.; 2 submerged torpedo tubes.

## ARGENTINE.

## BATTLESHIPS.

Moreno.

Rivadavia



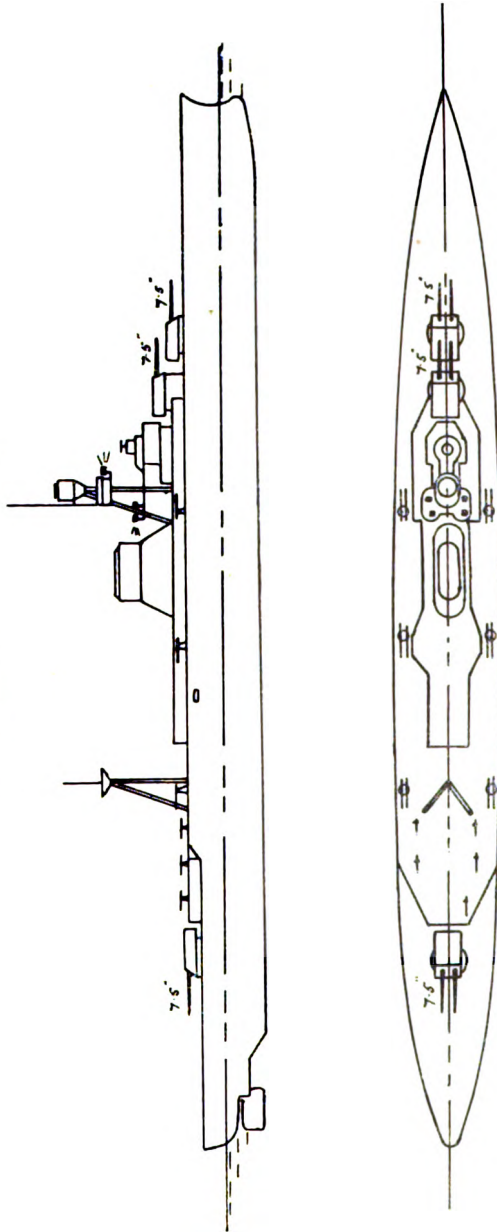
Length (extreme), 586 ft. ; Length on W.L., 575 ft. ; 27,940 tons : Speed, 22½ knots : Completed, 1914-15.  
 Armament, 12-12-in. ; 12-6-in. ; 4-3-in. A.A. ; 4-3-pr. ; 6 M. ; 4 L. ; 2 torpedo tubes.



ARGENTINE.

CRUISERS.

Almirante Brown. 25 Maio.



Length (waterline), 546 ft. ; 6,495 tons ; Speed, 32 knots.  
Armament, 6—7.5-in. ; 12—4-in. A.A. ; 6 Pom Poms ; 6 torpedo tubes.

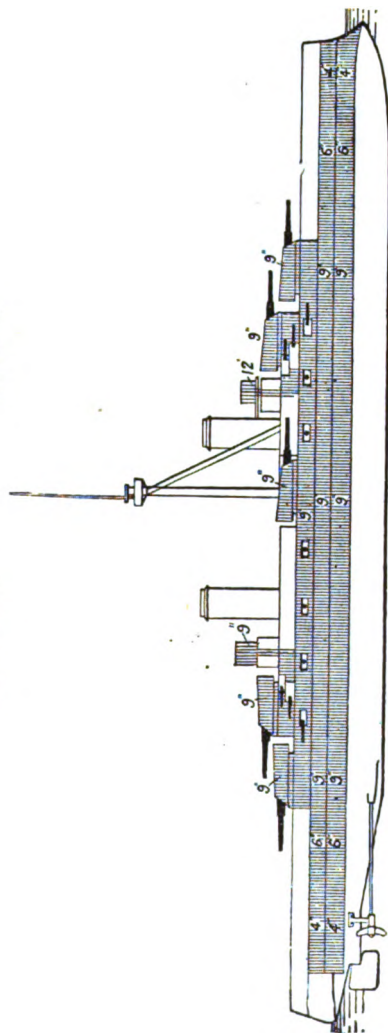


## BRAZIL.

## BATTLESHIPS.

Minas Geraes.

São Paulo.



Length (extreme), 543 ft. ; Length B.P., 500 ft. ; 19,281 tons ; Speed, 21.5 knots ; Completed, 1909, 1910.

Armament, 12—12-in. ; 8—6-in. ; 8—4.7-in. ; 2—3-in. A.A. ; 4 M.

Overhauled and refitted at Brooklyn Navy Yard, 1921-22, and A.A. guns installed.





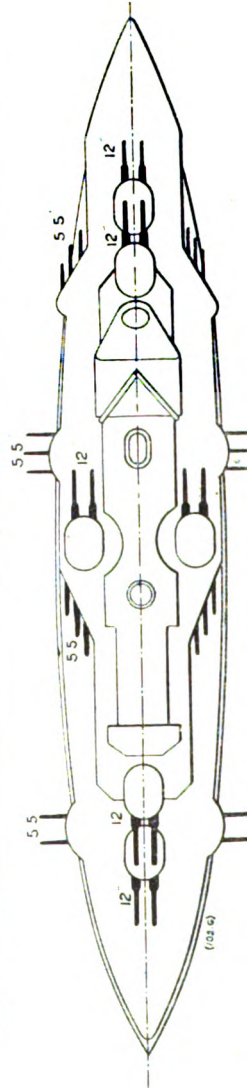
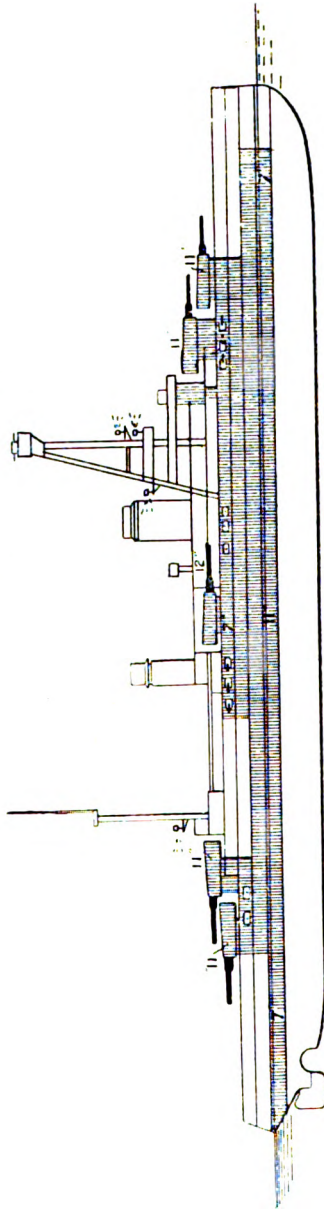
## FRANCE.

## BATTLESHIPS.

Jean Bart.

Courbet.

Paris.



Length (extreme) 544 ft. 6 ins. ; Length B.P., 541 ft. 4 ins. ; 23,128 tons ; Speed, 20 knots ; Completed, 1913 14. Modernised in 1929.  
 Taken in hand for conversion to oil burning, 1931.  
 Armament, 12-12-in. ; 22-5.5-in. ; 4-3-in. A.A. ; 4-3-pr. ; 2-1-pr. (Courbet has 3-3-pr.)

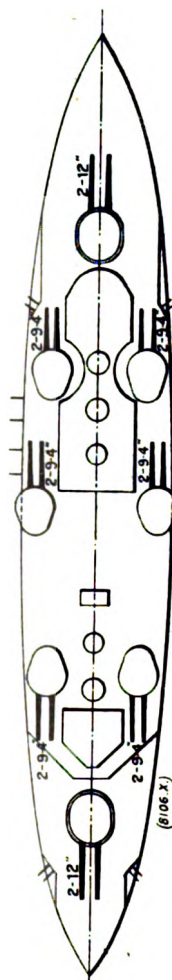
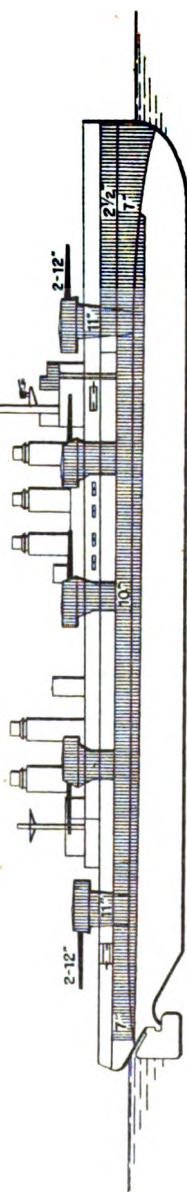
## FRANCE

## BATTLESHIPS.

Condorcet.

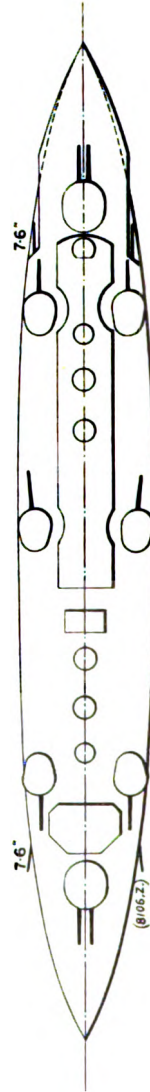
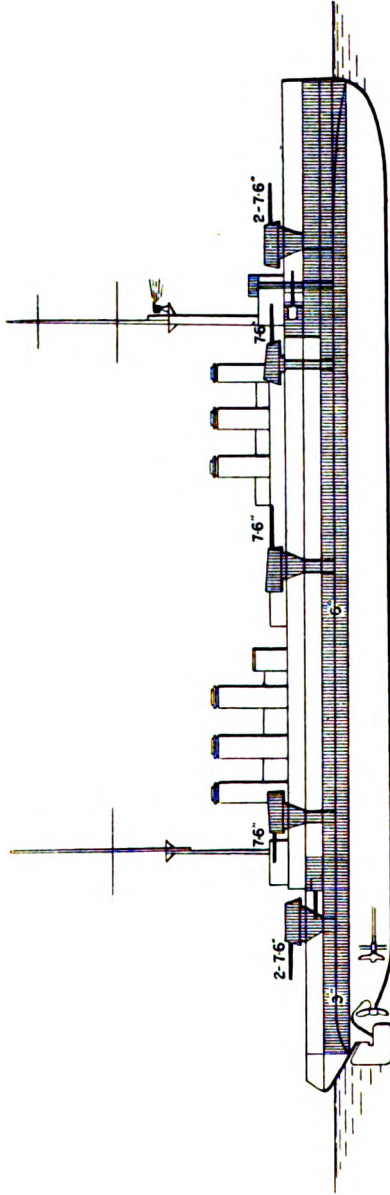
Diderot.

Voltaire.



Length (extreme), 481 ft.; Length W.L., 475 ft. 9 ins.; Speed, 19½ knots; 18,592 tons; Completed, 1911.  
 Armament, 4-12-in.; 12-9-4-in.; 12-3-in. A.A.; 4-3-pr. A.A.; 2-1-pr.; 2 L.; 2 torpedo tubes.

FRANCE.  
ARMoured CRUISER  
Waldeck Rousseau.



Length (extreme), 521 ft. 4 ins. ; Length, W. L., 515 ft. ; Speed, 23 knots ; 13,828 tons ; Completed, 1911.  
Armament, 14-7.6-in. ; 10-3-in. ; 10-9-pr. A.A. ; 2-8 pr. ; 2 M. ; 2 torpedo tubes.

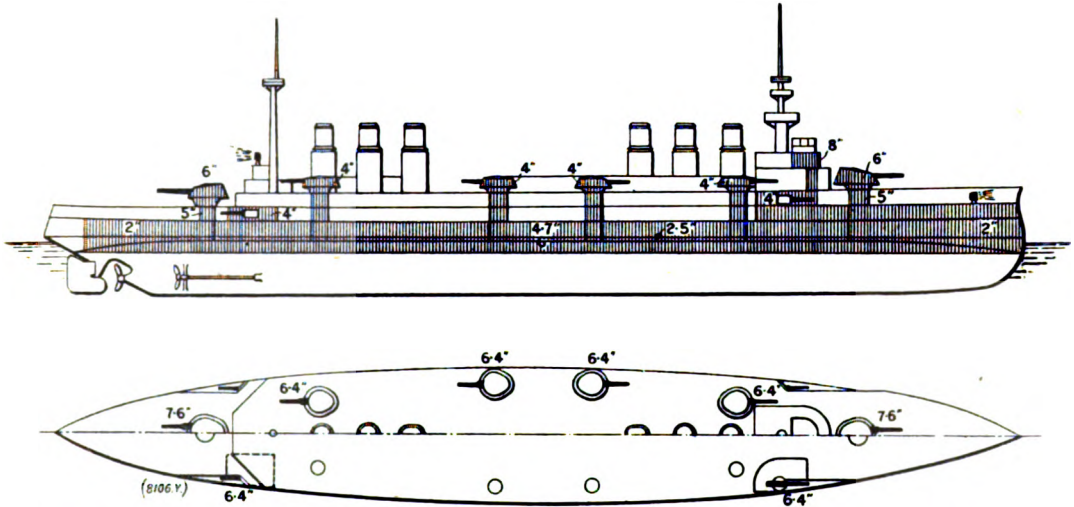


## FRANCE.

## ARMoured CRUISERS.

Ernest Renan.

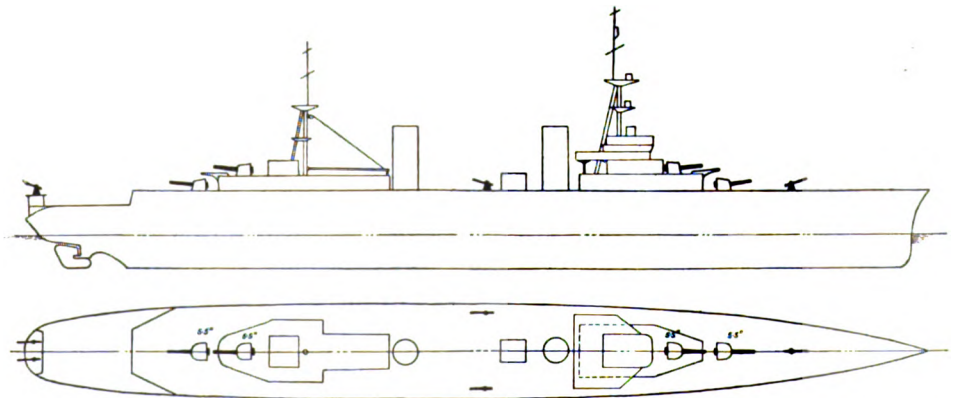
Jules Michelet



Length, 521 ft. 7 ins. and 489 ft. ; 13,500 tons and 12,400 tons ; Speed, 23 knots and 22 knots ; Completed, 1909 and 1908.  
 Armament : Ernest Renan, 4—7·6-in., 12—6·5-in. ; 4—3-in. ; 2—3-in. A.A. ; 8—9-pr. ; 2—1-pr. ; 2 torpedo tubes.  
 Jules Michelet, 4—7·6-in. ; 12—6·5-in. ; 2—3-in. A.A. ; 10—3-pr. ; 2 M. ; 2 torpedo tubes.

## CRUISER MINELAYER.

Pluton.



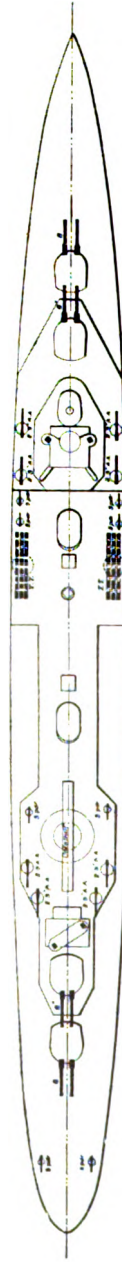
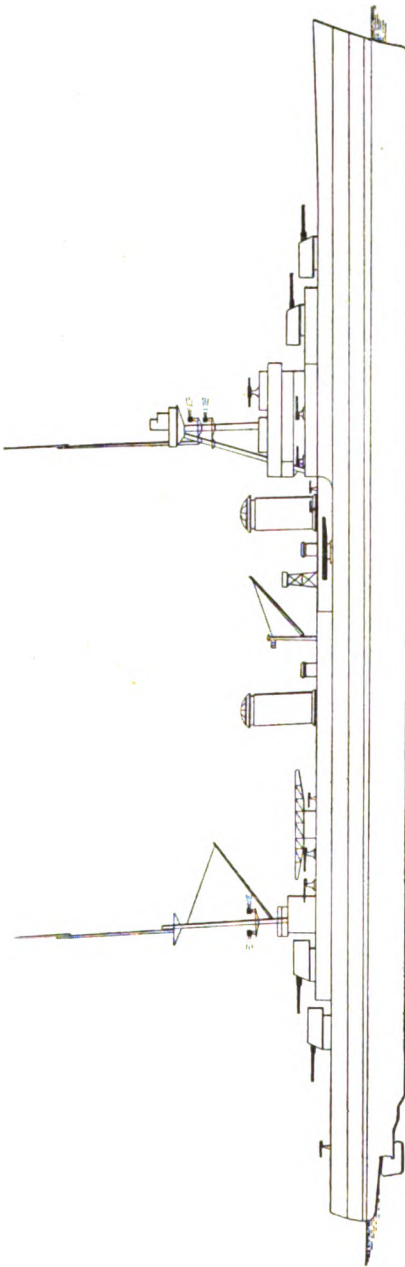
Length, 472 ft. ; 4,773 tons ; Speed, 30 knots ; Completed, 1931.  
 Armament : 4—5·5-in. , 10—1-pdr. ; 12 M. ; 1,000 mines.



## FRANCE.

## CRUISERS.

Duquesne.	Tourville.	Suffren.	Colbert.	Foch.	Dupleix.
		Algérie.†			



Length (extreme), 607 ft. (Duquesne and Tourville, 626 ft. 8 in.); 10,000 tons ; Speed, 33 knots.  
 Armament, 8—8-in., 8—3-in. A.A. (Dupleix, Colbert and Foch have 8—3-6-in. A.A.) ; 8—1-pr. ; 2—triple T.T.'s.

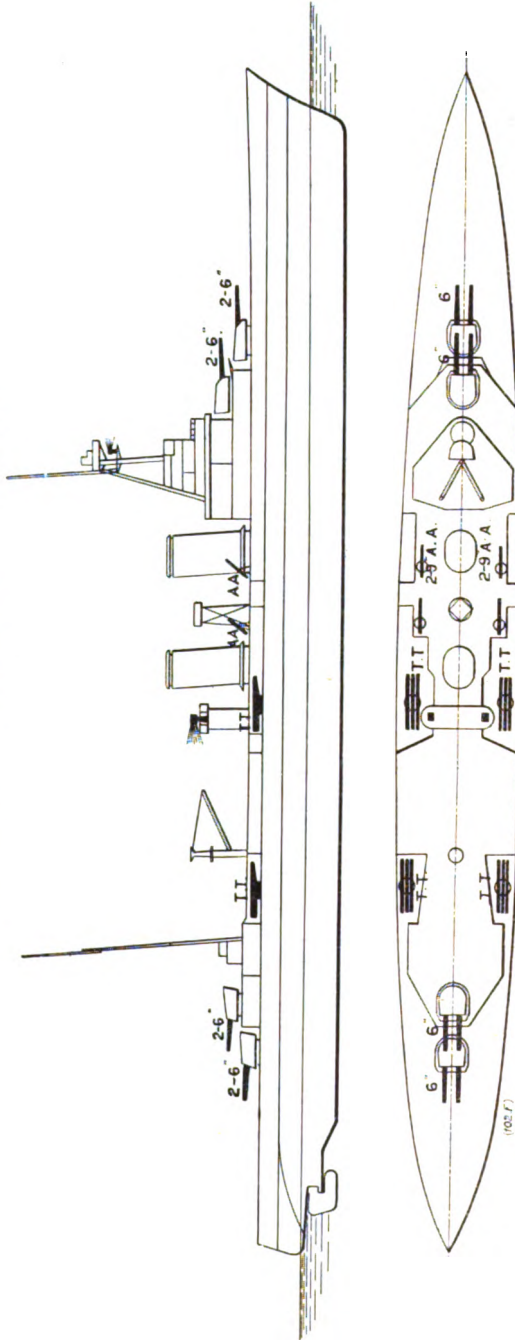
The above plan is for Duquesne and Tourville. The others differ slightly from this in details of bridges, cranes, catapults, etc. Suffren has 2 catapults in the position shown above. Colbert, Dupleix and Foch have 2 catapults between the funnels and the cranes abreast the after funnel. Foch and Colbert have tripod mainmasts.

† Algérie is of similar dimensions and has a similar arrangement of main armament to the above, but has a flush deck, one large funnel only, and a "block" bridge instead of a tripod foremast.

## FRANCE.

## LIGHT CRUISERS.

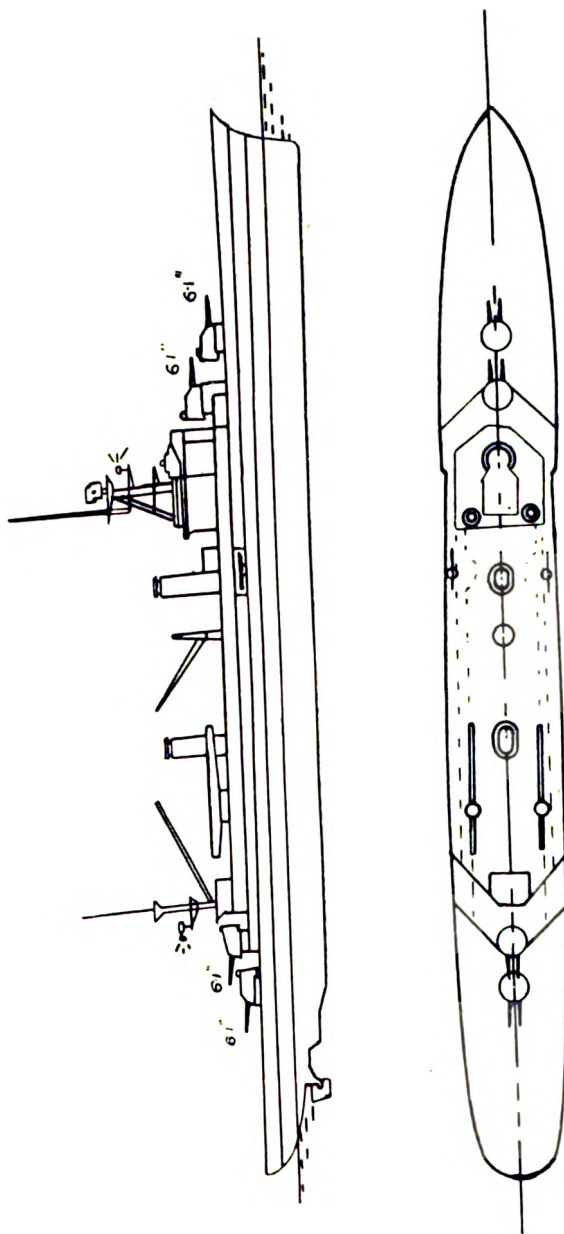
La Motte Piquet.      Duguay-Trouin.      Primauguet.



Length (extreme), 594 ft. 10 ins. ; Length B.P., 575 ft. ; 7,249 tons ; Speed, 34 knots. Completed, 1926-27.  
 Armament, 8-6-1-in. ; 4-3-in. A.A. ; 2-3-pr. ; 2 M. ; 1 L. ; 4 triple torpedo tubes (21-7-in. torpedoes) ; Catapult on quarter deck.

NOTE.—Reported to have protection to magazines.

FRANCE.  
TRAINING CRUISER.  
Jeanne d'Arc.

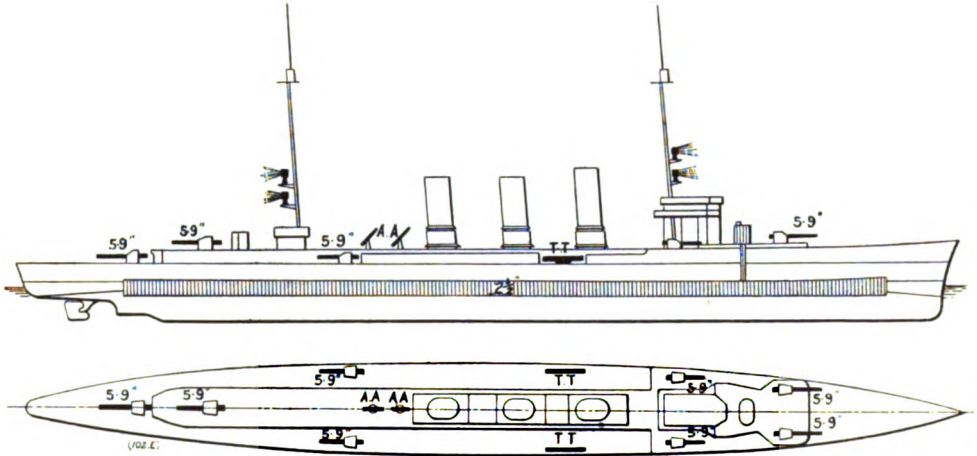


Length (extreme), 557 ft. 8 ins. ; 6,500 tons ; Speed, 26 knots.  
Armament, 8—6' 1/2-in. ; 4—3-in. A.A. ; 2—1' 6-in. ; 2 M. ; 2 torpedo tubes.  
2 catapults ; 2 seaplanes.

FRANCE.

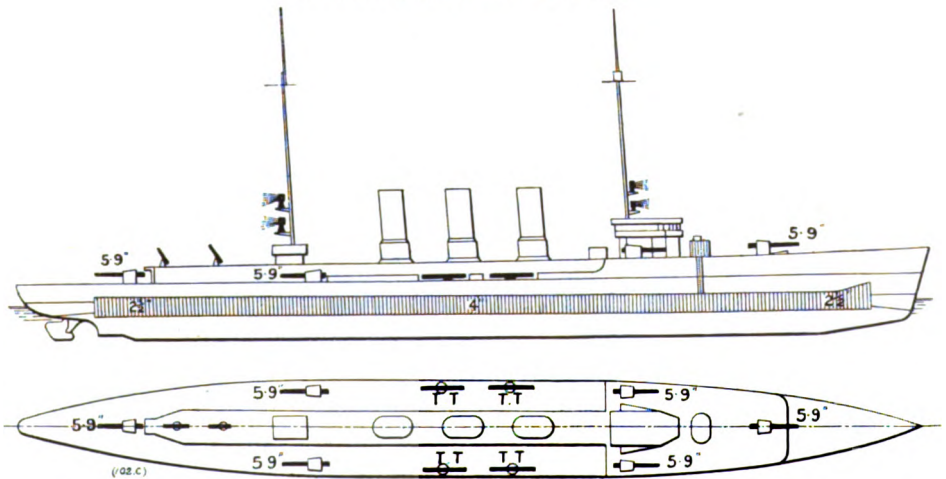
LIGHT CRUISERS.

Metz (*ex-German Königsberg*).



Length (water-line), 489 ft. ; 5,265 tons ; Speed, 27 knots ; Completed, 1916.  
Armament, 8—5.9-in. ; 2—3-in. A.A. ; 4 M. ; 4 torpedo tubes (2 above water, 2 submerged).

Strasbourg (*ex-German Regensburg*).

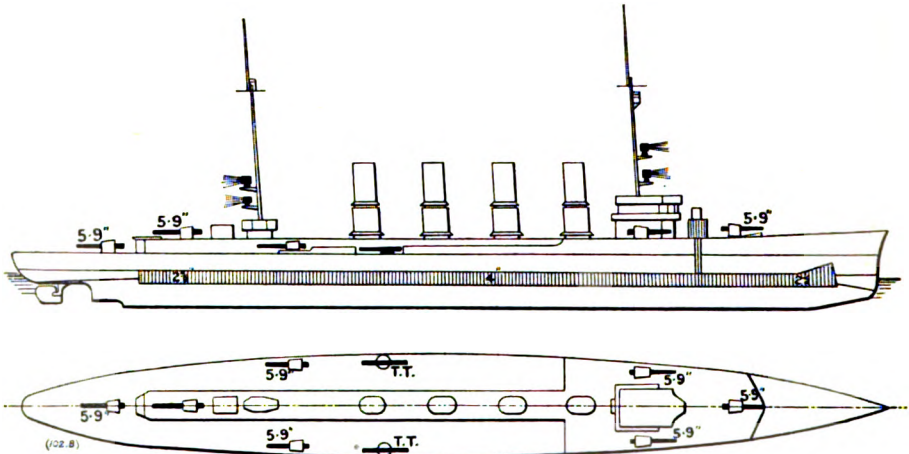


Length (extreme), 468 ft. ; Length (water-line), 456 ft. ; 4,723 tons ; Speed, 26 knots ; Completed, 1914.  
Armament, 7—5.9-in. ; 2—3-in. A.A. ; 4 torpedo tubes (19.7-in. torpedoes).

FRANCE

LIGHT CRUISER.

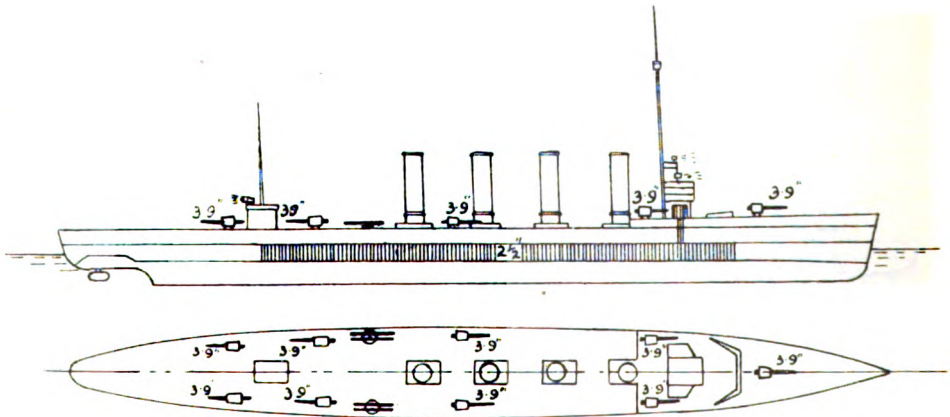
Mulhouse (*ex-German Stralsund*).



Length (water-line), 446 ft. 3 ins. ; 4,529 tons ; Speed, 26½ knots ; Completed, 1913.  
Armament, 7—5.9-in. ; 2—3-in. A.A. ; 2 M. ; 2 torpedo tubes (19.7-in. torpedoes).

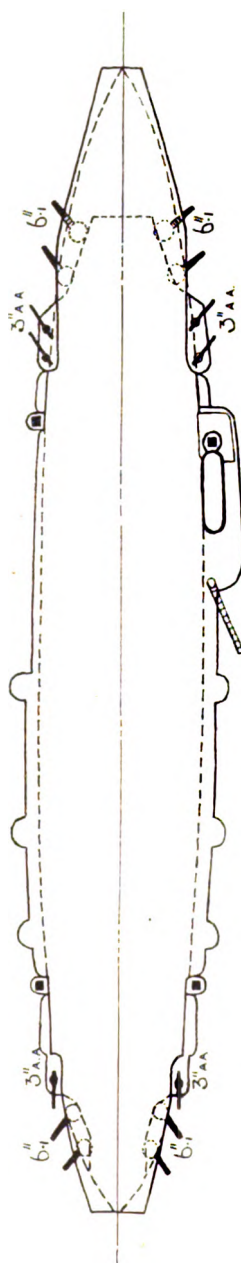
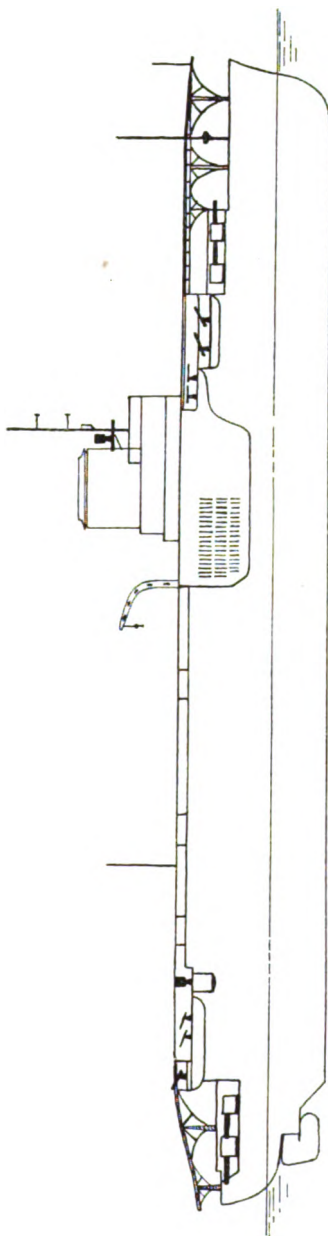
LIGHT CRUISER.

Thionville (*ex-Austrian Novara*).



Length (extreme), 428 ft. 6 ins. ; 2,922 tons ; Speed, 27 knots.  
Armament, 9—3.9-in. ; 2—3-in. A.A. ; 2 twin above-water torpedo tubes.  
Correction to plan : The torpedo tubes are fitted right aft.

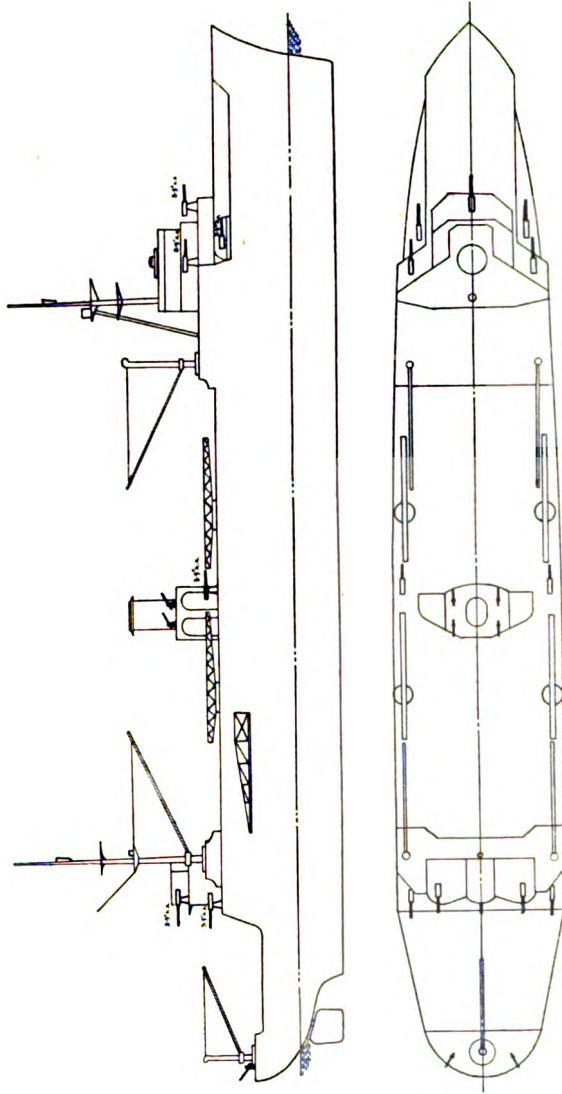
FRANCE.  
AIRCRAFT CARRIER,  
Béarn.



Length (extreme), 597 ft. ; 22,146 tons ; Speed, 21.6 knots.  
Armament, 8—6-1-in. ; 6—3-in. A.A. ; 8—1-pr. A.A. ; 12 M. A.A. ; 41 planes.



FRANCE.  
SEAPLANE CARRIER.  
Commandant Teste.



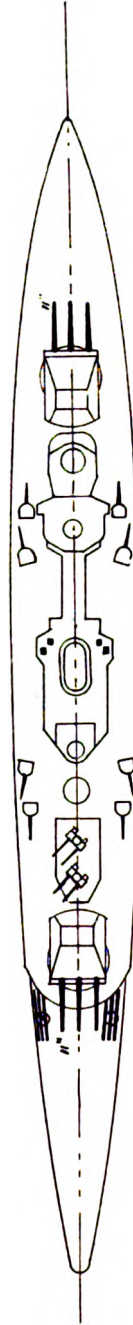
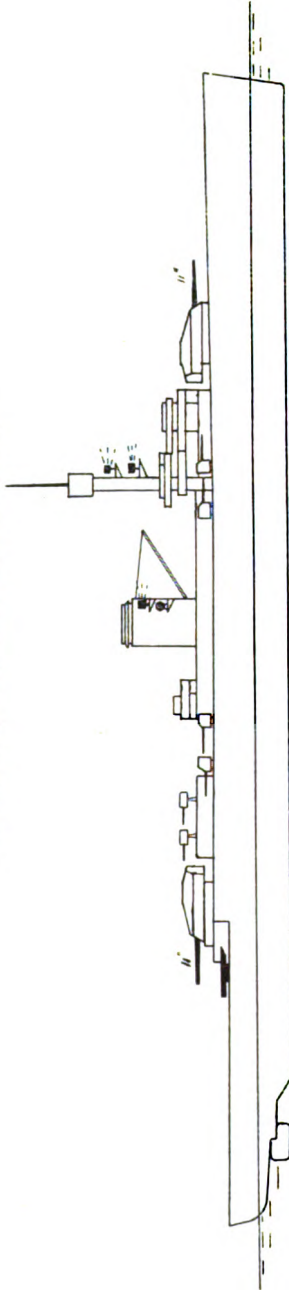
Length (extreme), 548 ft.; 10,000 tons; Speed, 20½ knots.  
Armament, 12—3·9-in. A.A.; 8—1-pdr. A.A.; 12 M.; 50 planes.



GERMANY.

BATTLESHIP.

*Deutschland (formerly known as Ersatz Preussen).*



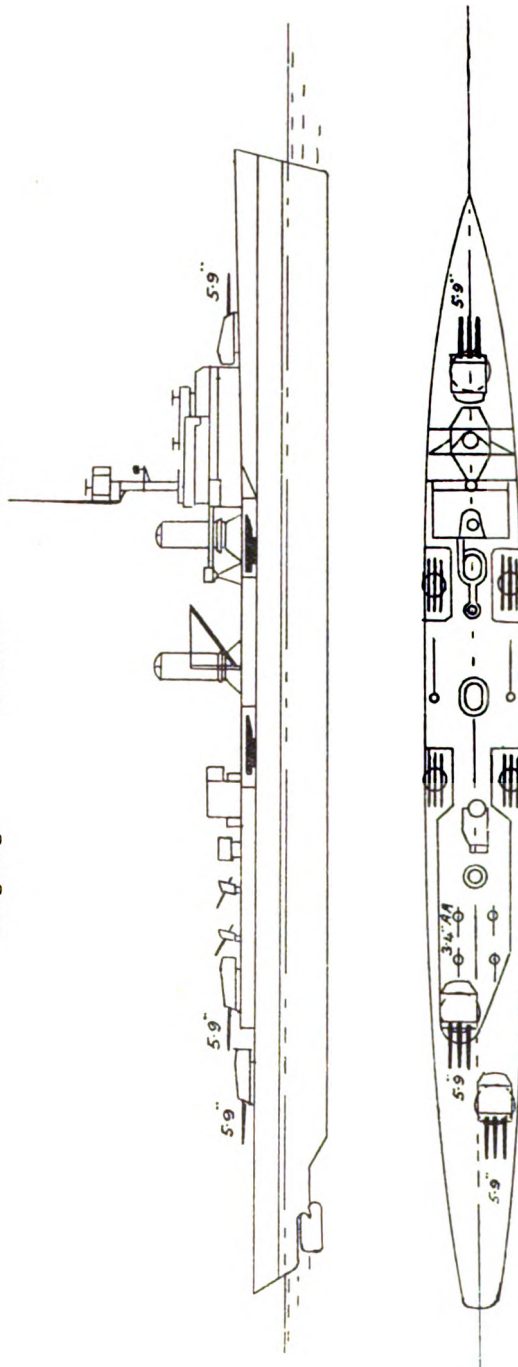
Length (extreme), about 590 ft. ; 10,000 tons ; Speed, 26 knots.  
Armament, 6—11-in. ; 8—6·9-in. ; 4—3-in. A.A. ; 6 torpedo tubes.

GERMANY.  
LIGHT CRUISERS.

Königsberg.

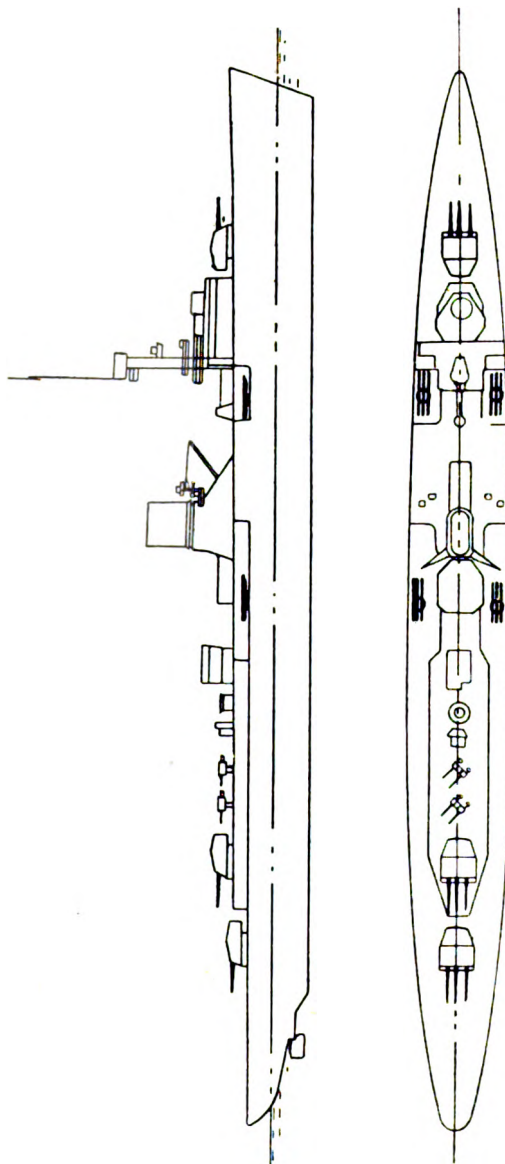
Karlsruhe.

Köln.



Length (extreme), 570 ft. 10 ins. ; 6,000 tons ; Speed, 32 knots.  
Armament, 9—5.9-in. ; 4—3.4-in. A.A. ; 4 triple torpedo tubes.

GERMANY.  
LIGHT CRUISER,  
Leipzig.

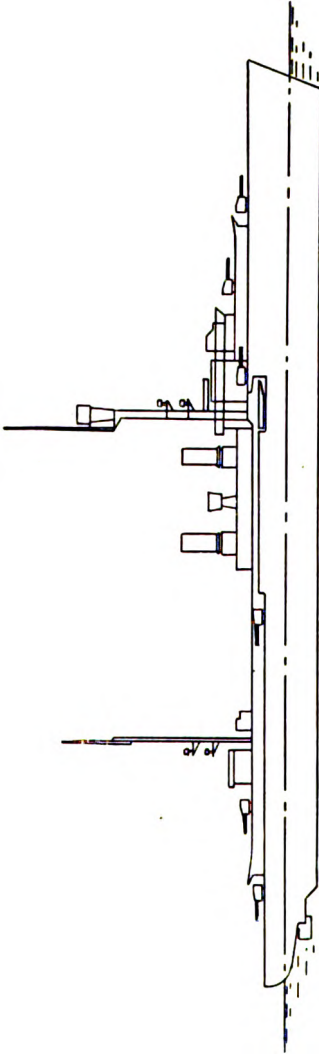


Length (W.L.), 543 ft. 10 ins.; 6,000 tons; Speed, 32 knots.  
Armament, 9—5·9 in.; 4—3·4 in. A.A.; 4 triple torpedo tubes.

GERMANY.

LIGHT CRUISER.

Emden.



Length (extreme), 510 ft. 2 ins. ; 6,000 tons ; Speed, 29 knots ; Completed, 1925.

Armament, 8-5-9-in. ; 2-3-6-in. A.A. ; 4 torpedo tubes in twin mountings.

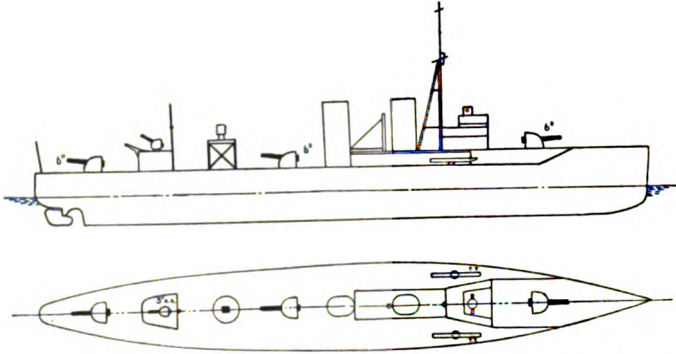
The 8-5-9-in. guns will be mounted in twin mountings, 2 forward and 2 aft, when the mountings are ready.

Correction to plan : The forward funnel is higher than the after one.

**GREECE.**

**CRUISER.**

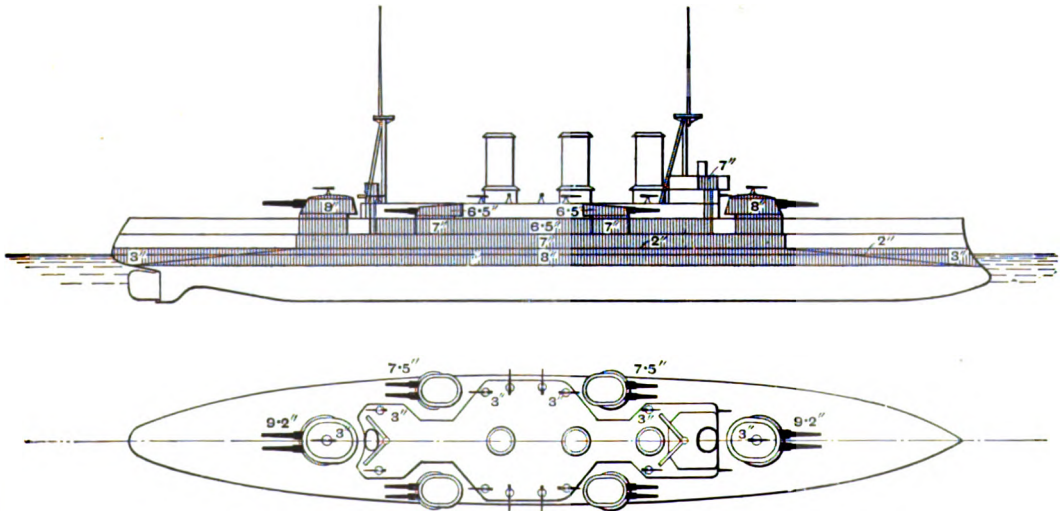
**Helle.**



Length, 322 ft. ; 2,083 tons ; Speed, 20 knots ; Completed, 1914 ; Reconstructed, 1929.  
Armament, 3—6-in. ; 1—3-in. A.A. ; 110 mines ; 2 torpedo tubes.

**ARMOURED CRUISER.**

**Giorgios Averoff.**

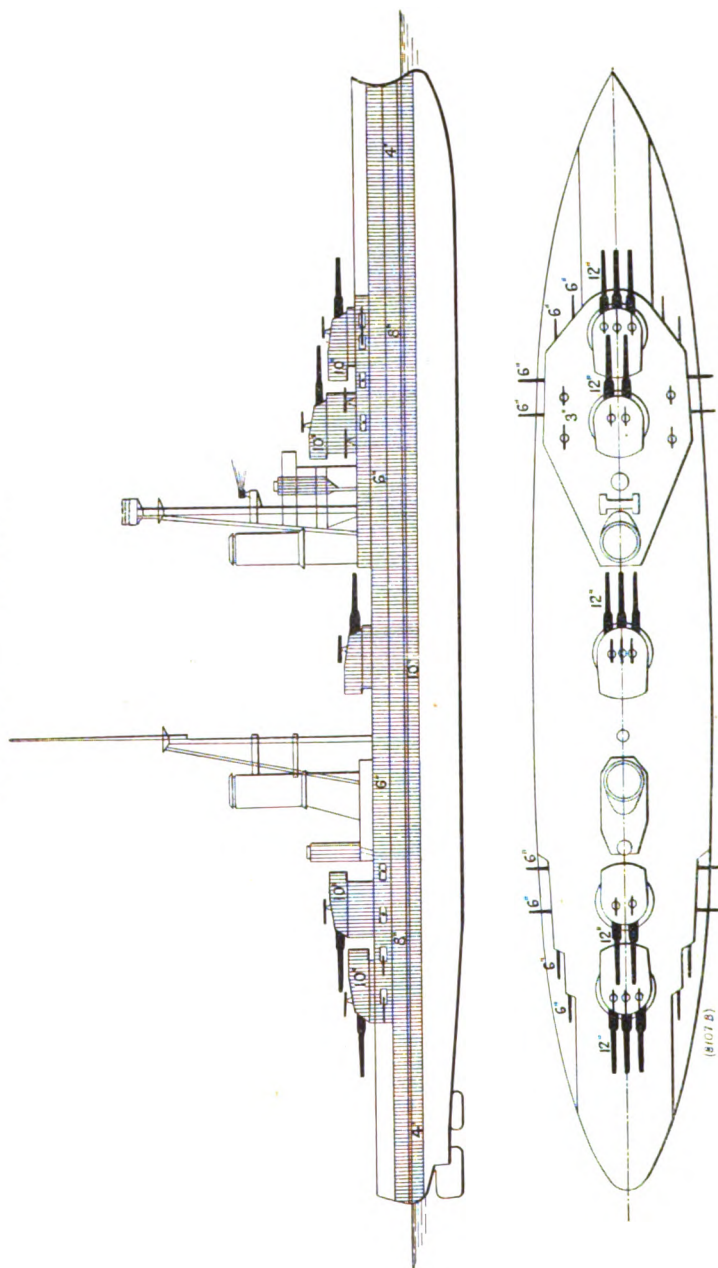


Length, 462 ft. ; 9,956 tons ; Speed, 24 knots ; Completed, 1911.  
Armament, 4—9·2-in. ; 8—7·5-in. ; 16—3-in. ; 2—3-in. A.A. ; 6 smaller.

## ITALY.

## BATTLESHIPS.

Andrea Doria. Caio Duilio.



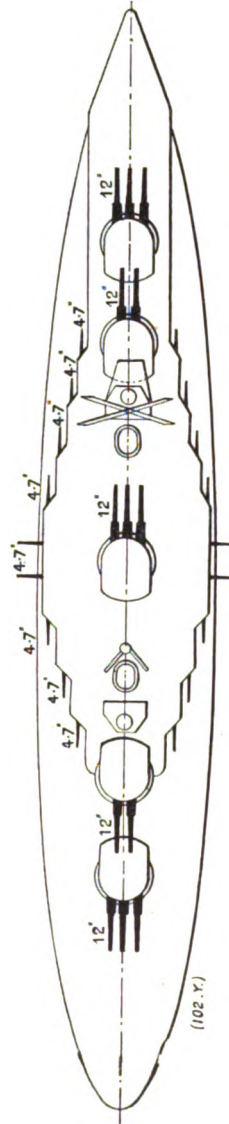
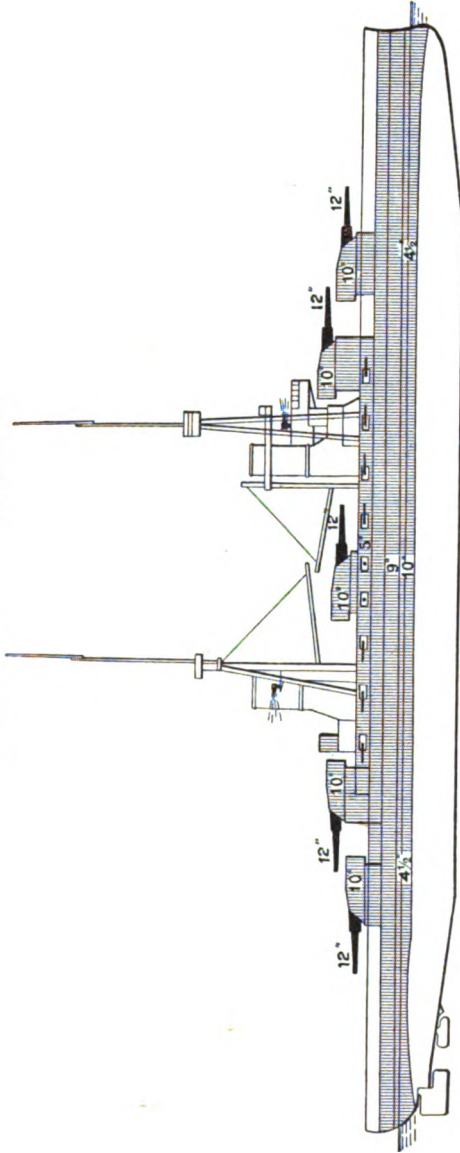
Length (extreme), 575 ft. 9 ins. ; Length B.P., 554 ft. 4 ins. ; Speed, 22 knots ; Completed, 1915.  
 Armament, 13-12-in. ; 10-6-in. ; 13-3-in. A.A. ; 2-2-pr. ; 6 M. ; 4 L. ; 2 torpedo tubes.

**ITALY.**

## BATTLESHIPS.

**Conte di Cavour.**

**Giulio Cesare.**



(102.Y.)

Length (extreme), 575 ft. 9 ins.; Length B.P., 554 ft. 4 ins.; Speed, 22 knots; 22,144 tons; Completed, 1914-1915.

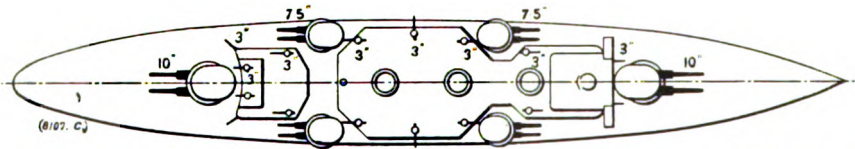
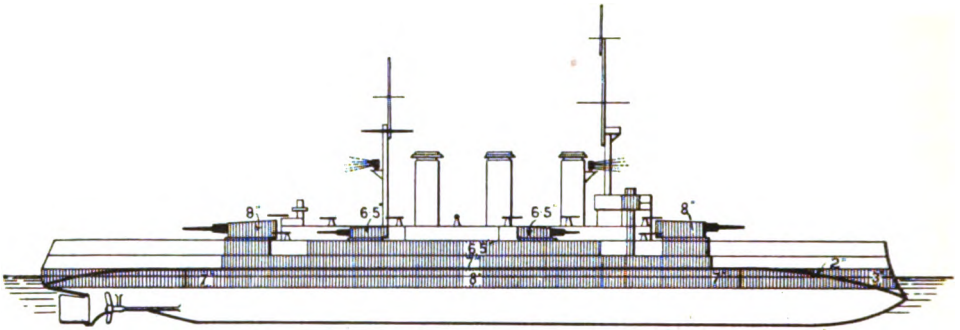
Armament, 13-12-in. ; 18-4.7-in. ; 13-3-in. ; 6-3-in. A.A. ; 2-2-pr. ; 2 M. ; 4 L.

A fixed catapult is mounted on port side of Forecastle Deck forward.



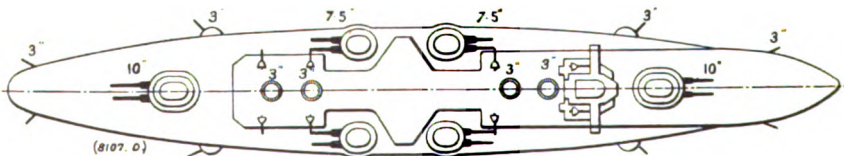
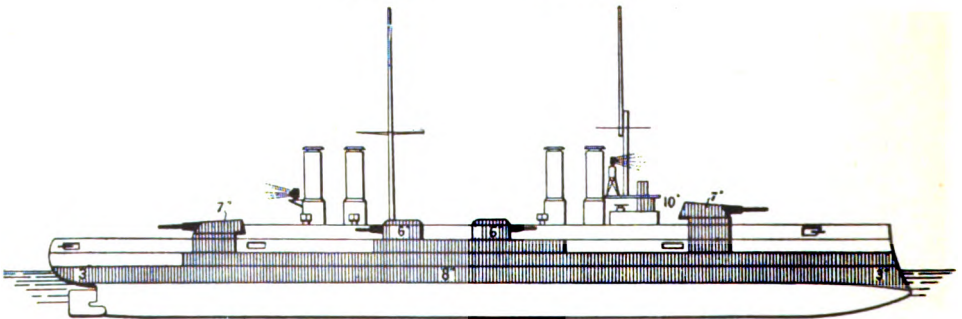
( P68 )

ITALY.  
ARMOURED CRUISER.\*  
Pisa.



Length (extreme), 460 ft. 11 ins. ; Length B.P., 426 ft. 6 ins. ; Speed,  $22\frac{1}{2}$  knots ; 8,759 tons ; Completed, 1908.  
Armament, 4—10-in. ; 8—7·5-in. ; 12—3-in. ; 6—3-in. A.A. ; 4 M. ; 2 L. ; 2—18-in. torpedo tubes.  
Cadets' Training Ship.

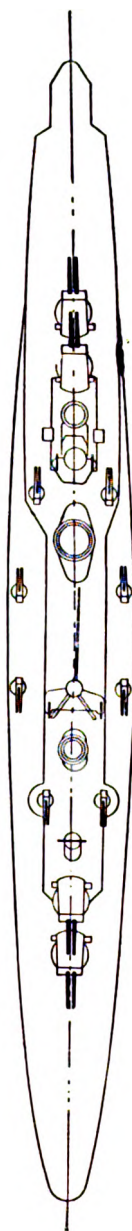
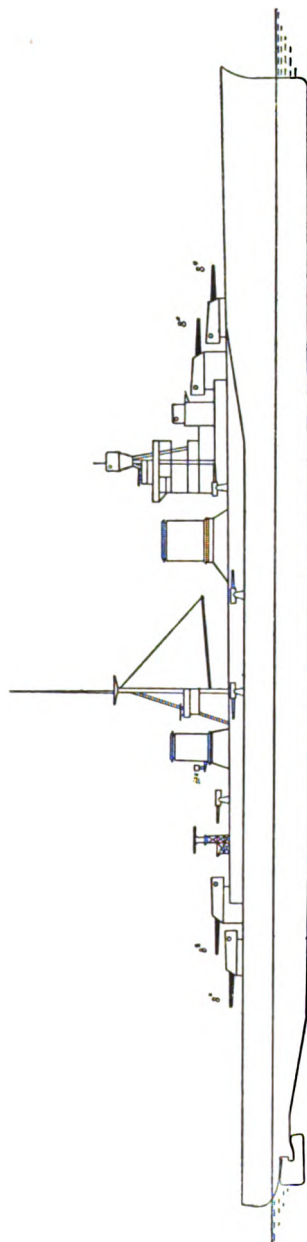
ARMOURED CRUISERS \*  
S. Giorgio. S. Marco.



Length (extreme), 462 ft. 2 ins. ; Length B.P., 429 ft. 10 ins. ;  
Speed, 22·5 and 23 knots ; 9,232 and 9,380 tons ; Completed, 1910.  
Armament, 4—10-in. ; 8—7·5-in. ; 10—3-in. ; 6—3-in. A.A. ; 2—3-pr. ; 6 M. ; 2 L. ; 2—18-in. torpedo tubes.

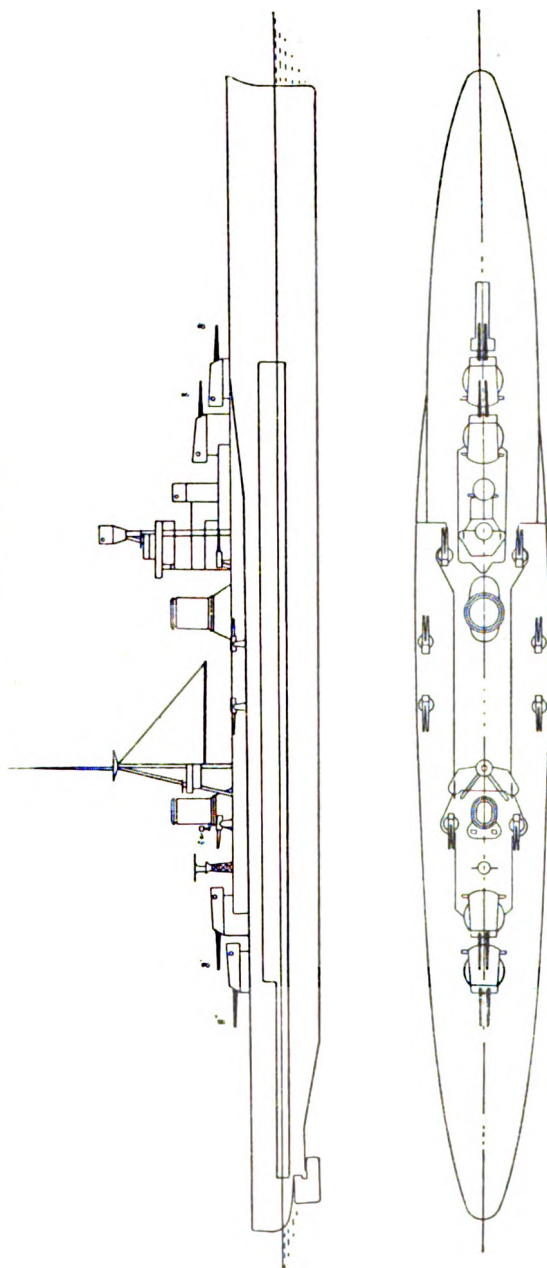
\* Classified as Battleships, 2nd class, in Italian official tests.

ITALY.  
CRUISER.  
Bolzano.



Length B.P., 644 ft.; 10,000 tons; Completed, 1932.  
Armament, 8—8-ins.; 16—3-9-in. A.A.; 12 smaller  
8 torpedo tubes may be fitted.

ITALY.  
CRUISERS.  
Pola. Zara. Fiume. Gorizia.



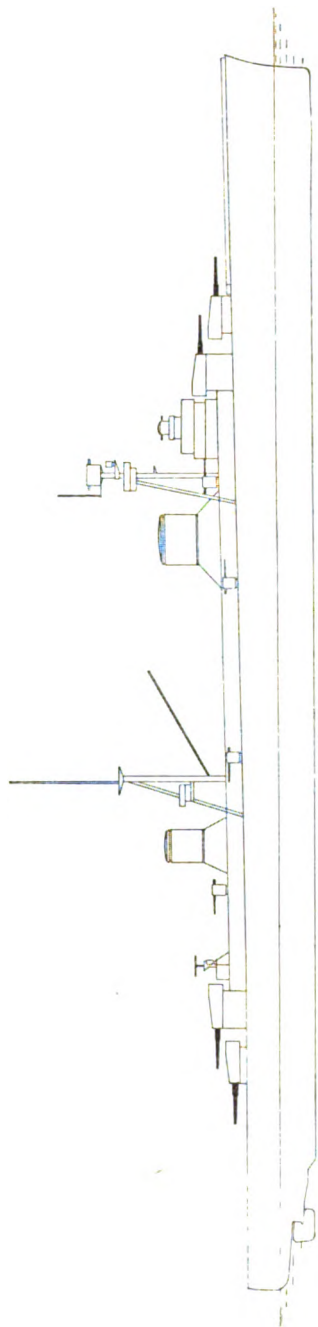
Length (Zara and Fiume), 599 ft. 5 ins.; 10,000 tons; Speed, 32 knots.  
Armament, 8—8-in., 16—3·9-in.; 12 smaller.

ITALY.

CRUISERS.

Trento.

Trieste.



Length (extreme), 640 ft. 9 ins. ; 10,000 tons ; Speed, 35 knots ; Completed, 1923.  
Armament, 8-8-in., 16-4-in. ; 2 twin T.T. s.

Correction to plan : The 4-in. guns between the funnels are twin guns.

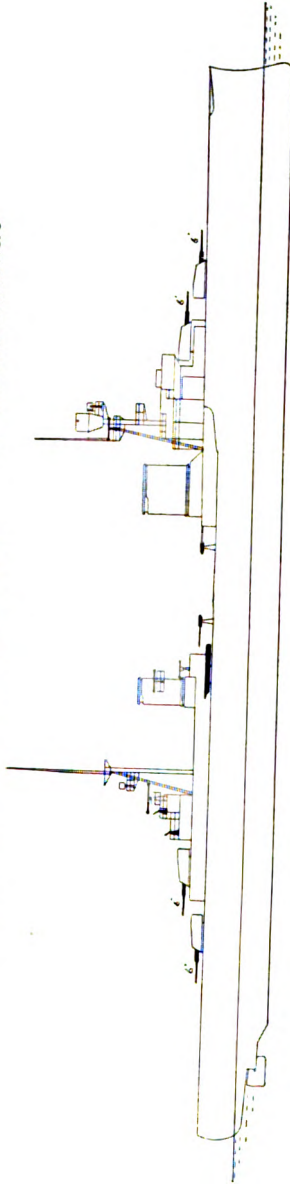
ITALY.

CRUISERS.

Armando Diaz.\*  
Luigi Cadorna.\*

Alberto di Guissano.  
Alberico di Barbiano.

Bartolomeo Colleoni.  
Giovanni della Bande Nere.



Length (extreme), 555 ft. ; 5,069 tons (\*559 ft., 5,009 tons) ; Speed, 37 knots.  
Armament, 8—6-in. ; 6—3·9-in. A.A. ; and smaller guns ; 4 torpedo tubes.  
1 catapult and 2 seaplanes.

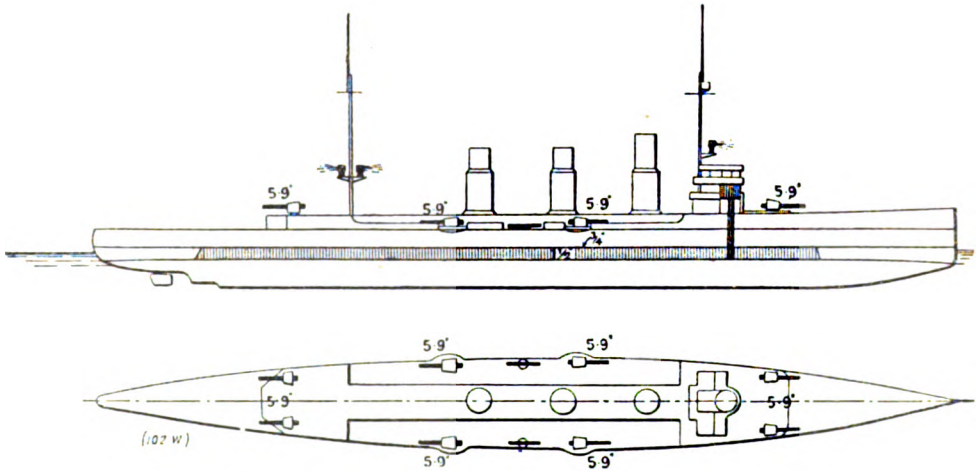
The bridge and foremast have been modified.

( P73 )

ITALY.

LIGHT CRUISER,

Bari (*ex-German Pillau*).

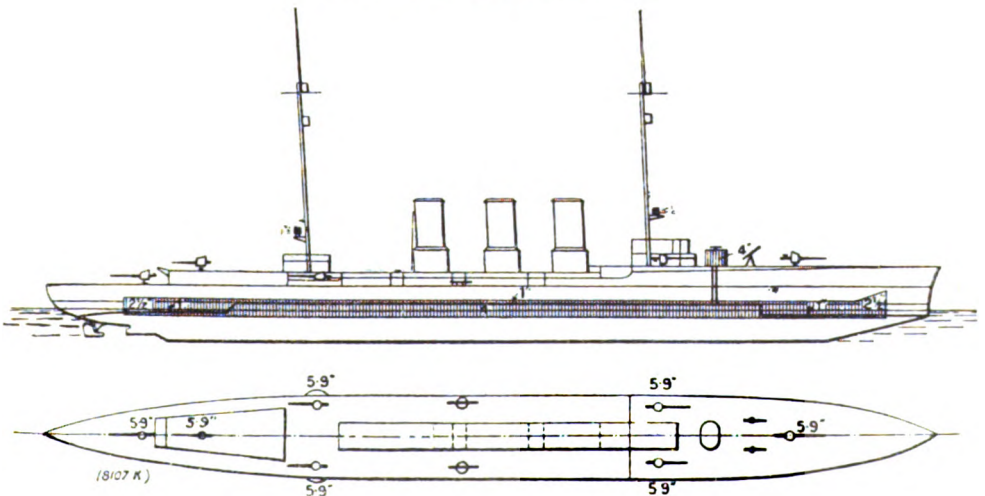


Length (extreme), 441 ft. ; Length B.P., 403 ft. ; 3,248 tons ; Speed, 27.5 knots ; Completed, 1914.  
Armament, 8—5.9-in. ; 3—3-in. A.A. ; 2 above-water torpedo tubes (19.7-in. torpedoes) ; 120 mines.

ITALY.

LIGHT CRUISER,

Ancona (*formerly German Graudenz*).

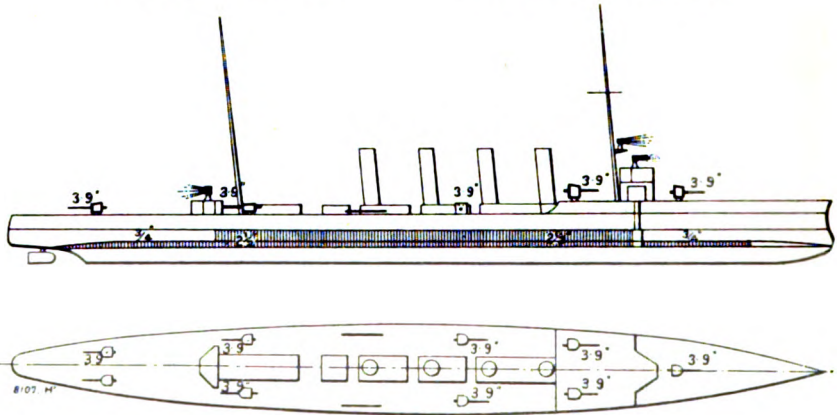


Length (extreme), 456 ft. ; Speed, 27½ knots ; 3,838 tons ; Completed, 1914.  
Armament, 7—5.9-in. ; 3—3-in. A.A. ; 2 submerged and 2 above-water torpedo tubes ; 120 mines.



## ITALY.

## LIGHT CRUISERS.\*

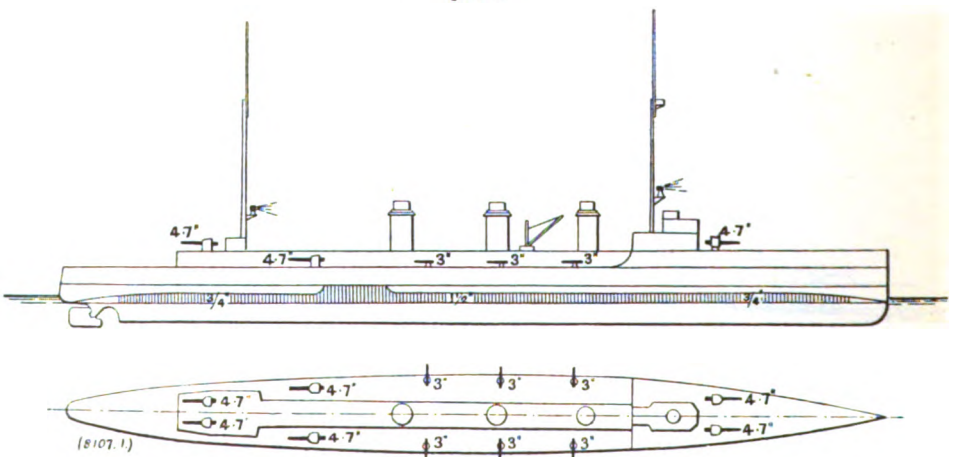
Venezia (*ex-Austrian Saida*),Brindisi (*ex-Austrian Helgoland*).

Length (extreme), 430 ft.; Length (w.L.), 416 ft. 9 ins.; Speed, 27 knots; 2,756 tons; Completed, 1914-15.  
Armament, 9—3.9-in.; 1—3-in. A.A.; 170 mines; 3 torpedo tubes.

NOTE.—Thionville (*ex-Austrian Novara*), sister ship, allocated to France.

## LIGHT CRUISER.\*

## Quarto



Length (extreme), 431 ft. 9 ins.; Length B.P., 413 ft. 5 ins.; Speed, 28 knots; 2,903 tons; Completed, 1912.  
Armament, 6—4.7-in.; 6—3-in.; 2—2-pr. A.A.; 2 above-water 18-in. torpedo tubes; 126 mines.

\* Classified as Scouts in Italian official tests.

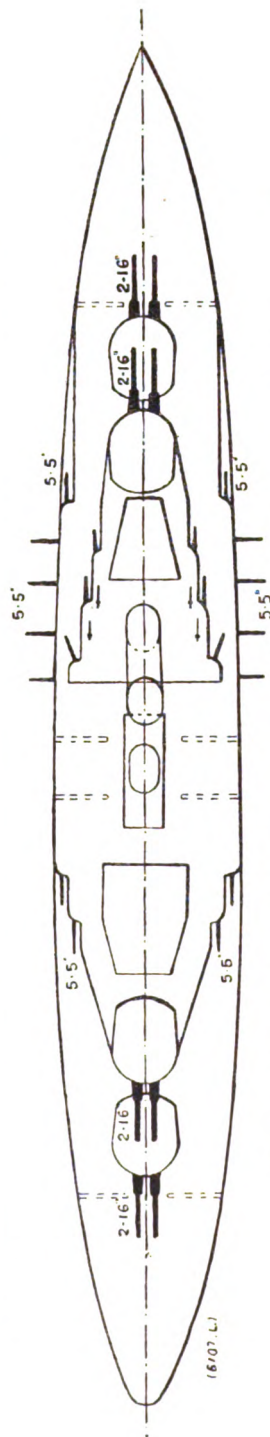
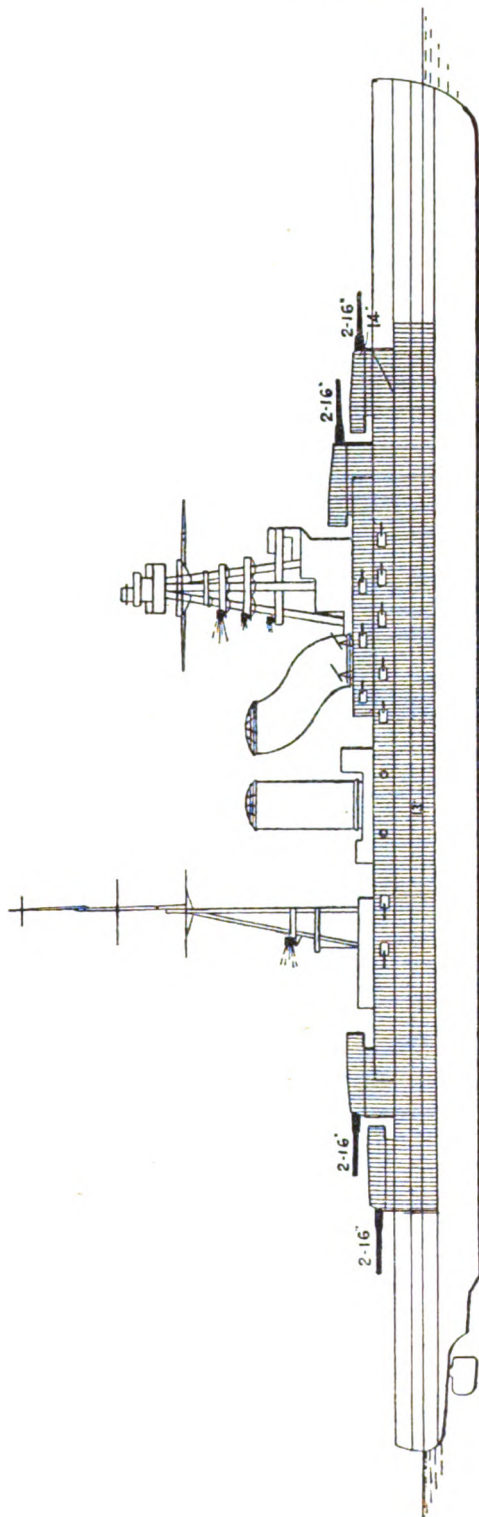


JAPAN.

BATTLESHIPS.

Nagato.

Mutsu.



Length (extreme), 700 ft. ; Length B.P., 660 ft. 7 ins. ; Speed, 23 knots ; 32,720 tons ; Completed, 1920-1921.  
Armament, 8-16-in. ; 20-5.5-in. ; 4-3-in. A.A. ; 4 above-water and 4 submerged 21-in. torpedo tubes.





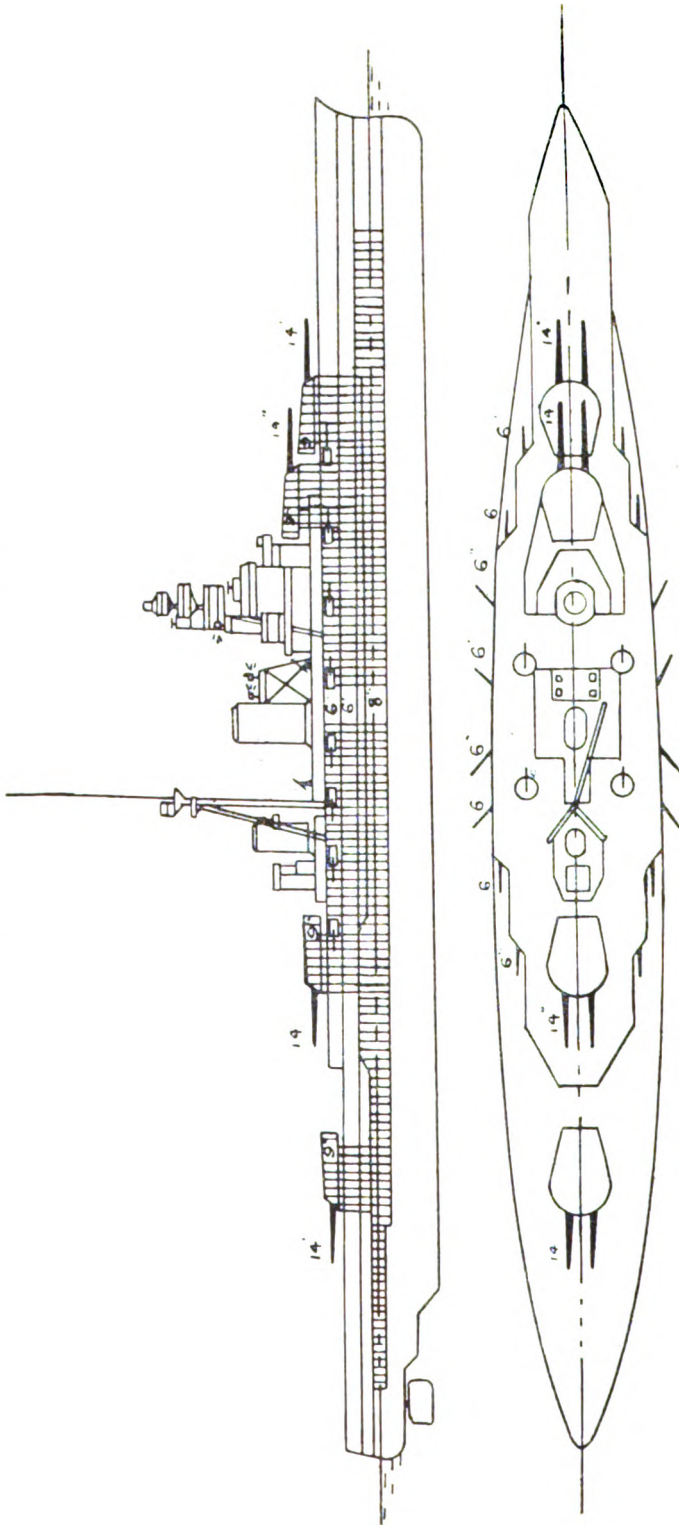
## JAPAN.

## BATTLESHIPS.

Haruna.

Kirishima.

Kongo.

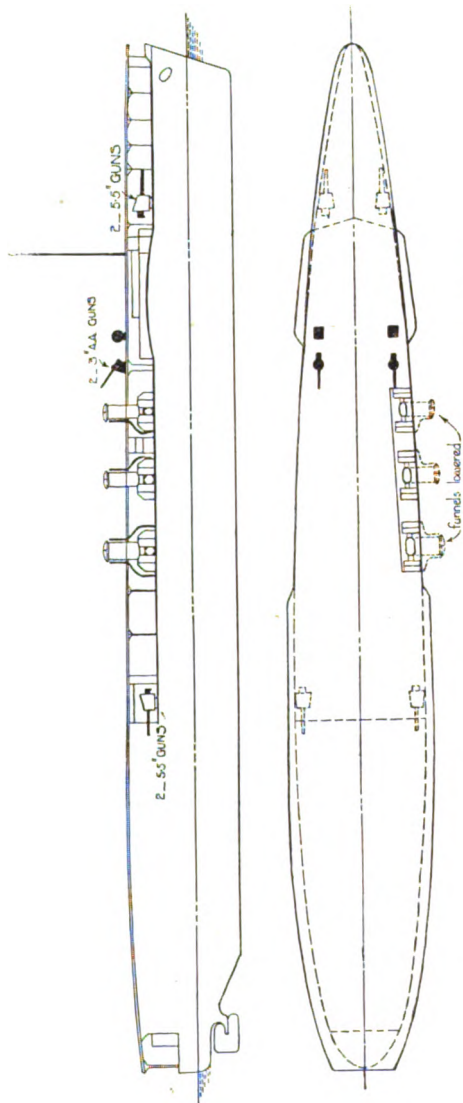


Length (extreme), 704 ft. ; Speed, 26 knots ; 29,330 tons ; Completed, 1914-15 ; Modernised 1928-31.

Armament, 8—14-in. ; 16—6-in. ; 4—3-in. A.A. ; 4 submerged 21-in. torpedo tubes.

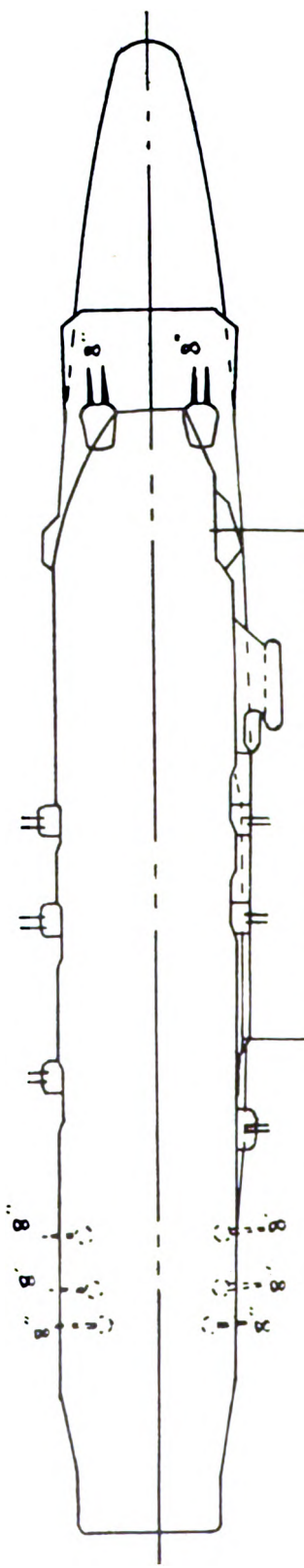
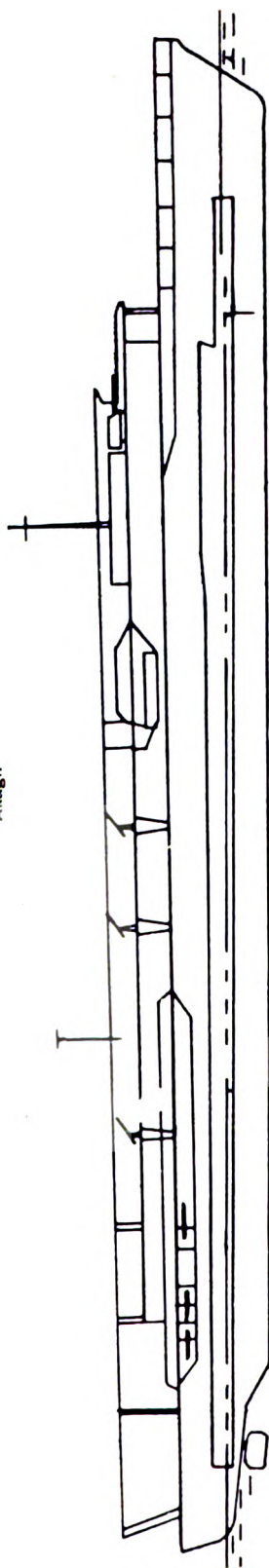
Hiyei of this class has been converted to a Training Ship in accordance with the London Naval Treaty.

JAPAN.  
AIRCRAFT CARRIER.  
Hosho.



Displacement, 7,470 tons ; Length B.P., 510 ft. ; Speed, 25 knots ; Completed, 1922.  
Armament, 4—5.5-in. ; 2—3-in. A.A. ; Carries about 28 planes ; Fitted with gyro-stabiliser.

JAPAN.  
AIRCRAFT CARRIER.  
Akagi.



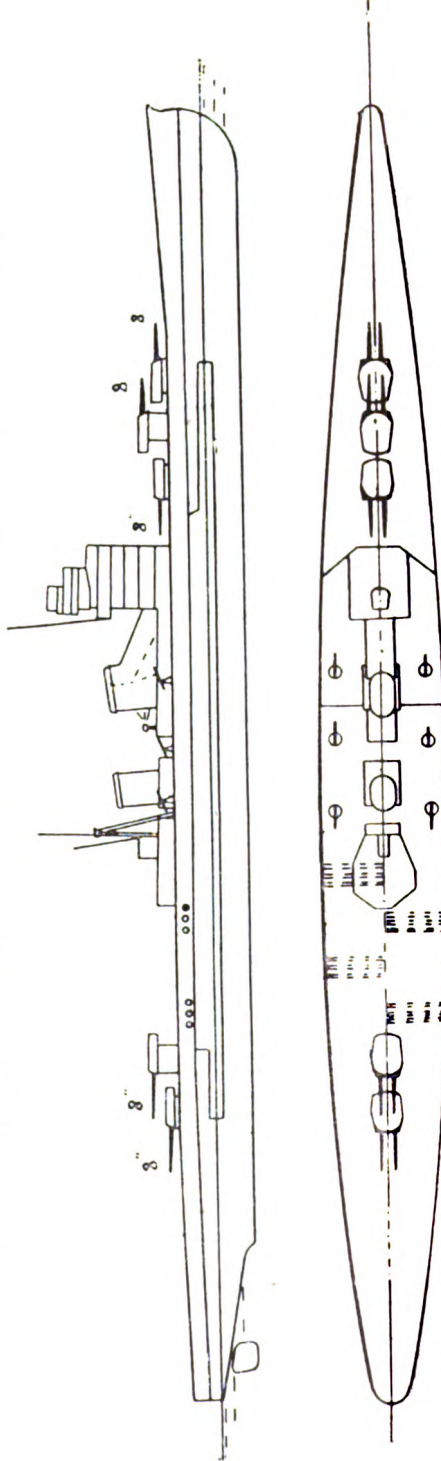
Length (between perpendiculars), 763 ft. ; 26,000 tons ; Speed, 28.5 knots.  
Armament, 10-8-in. ; 12-4.7-in. A.A. Accommodation for 50 planes.



## JAPAN.

## LIGHT CRUISERS.

Nachi. Myoko. Ashigara. Haguro. Atago.\* Takao.\* Chokai.\* Maya.\*



Length (between perps), 630 ft.; 10,000 tons; speed, 33 knots.  
Armament, 10—8-in.; 6—4·7-in. A.A.; 12 torpedo tubes; 1 catapult.

\* These have 4—4·7-in. A.A., and 8 torpedo tubes.

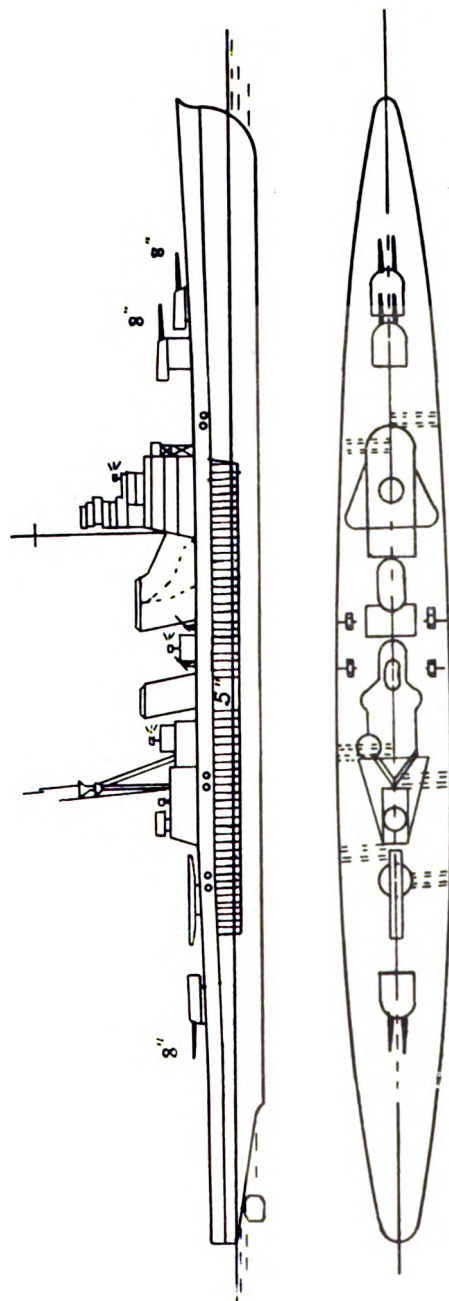
Correction to plan: The foremost pair of 4·7-in. A.A. guns should be shown a deck higher.



## JAPAN.

## CRUISERS.

Aoba. Kinugasa.

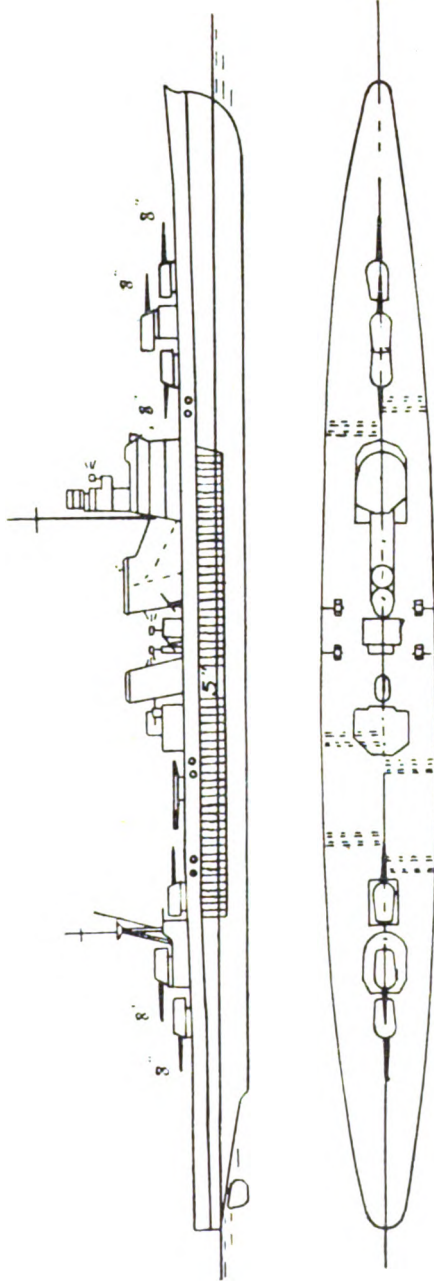


Length (extreme), 595 ft. ; 7,100 tons ; Speed, 33 knots.  
 Armament, 6-8-in. ; 4-4-7-in. A.A. ; 12 torpedo tubes.  
 1 catapult ; 2 aircraft.

## JAPAN.

## CRUISERS,

Furutaka. Kako.



Length (extreme), 595 ft.; 7,100 tons; Speed, 33 knots.

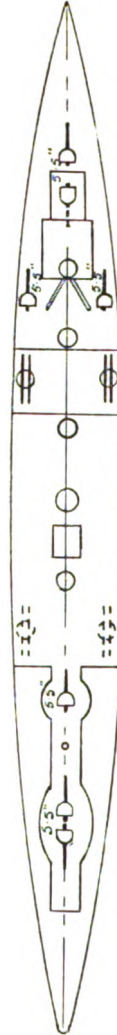
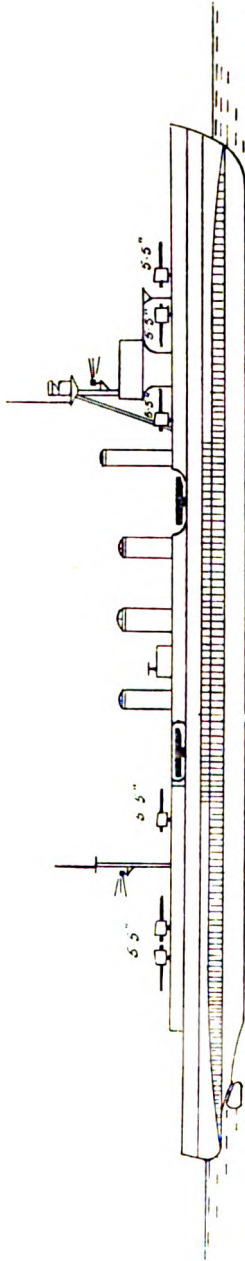
Armament, 6—8-in.; 4—3-in. A.A.; 12 above-water torpedo tubes.  
1 catapult; 2 aircraft.

Correction to plan : The tops of the funnels are square to the funnels.

## JAPAN.

## LIGHT CRUISERS.

Naka,                      Sendai,                      Jintsu.



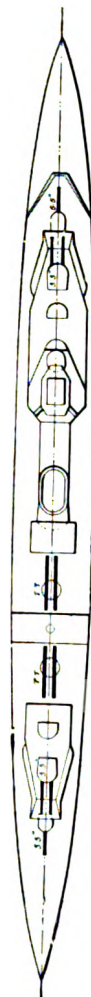
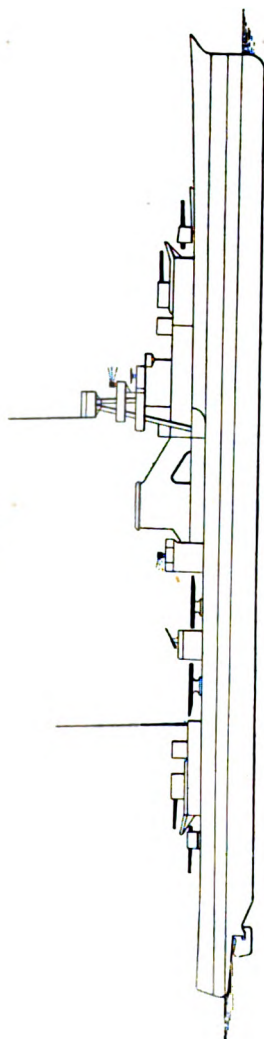
Length (extreme), 535 ft. ; Speed, 33 knots ; 5,195 tons.

Armament, 7—5·5-in. ; 2—3-in. A.A. ; 4 twin torpedo tubes.

1 seaplane.

Correction to plan : Bows of Jintsu and Naka have been modified to give more flair.

JAPAN.  
LIGHT CRUISER.  
Yubari.



Length (extreme), 465 ft. ; Length B.P., 435 ft. ; 2,890 tons ; Speed, 33 knots. Completed, 1923.  
Armament, 6—5·5-in. ; 1—3-in. A.A. ; 2 M. ; 2 twin 21-in. torpedo tubes ; 34 mines.

( P86 )

JAPAN.

LIGHT CRUISERS.

\* Isudzu.  
Nagara.

Oi.

Kiso.

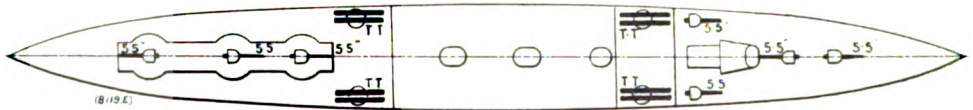
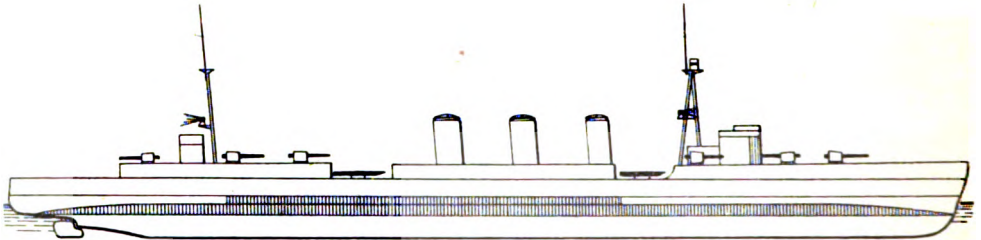
\* Natori.  
Yura.

Kitakami.

Tama.

\* Kinu.  
Abukuma.

Kuma.



Length (extreme), 535 ft. ; Length B.P. , 500 ft. ; Speed, 33 knots ; 5,100 tons ; Completed, 1920-21.

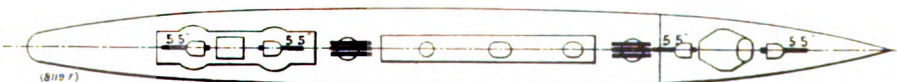
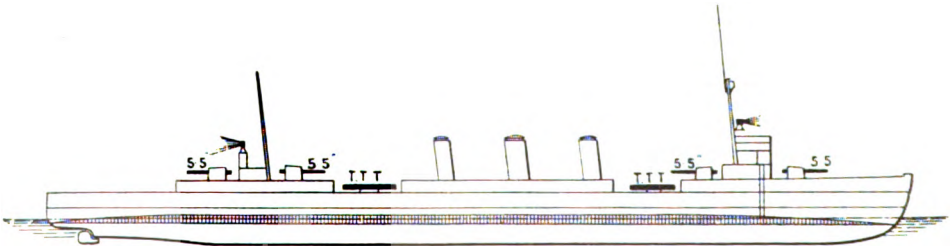
Armament, 7—5·5-in. ; 2—3-in. A.A. ; 4 twin above-water 21-in torpedo tubes.

\* Plans apply generally to these vessels except that aircraft hangar and a catapult are arranged in bridge structure. The displacement is 70 tons higher than Oi, etc. These vessels were completed, 1922-23.

LIGHT CRUISERS.

Tatsuta.

Tenryu.



Length (extreme), 463 ft. ; Speed, 31 knots ; 3,230 tons ; Completed, 1919.

Armament, 4—5·5-in. ; 1—3-in. A.A. ; 2 triple above-water torpedo tubes.

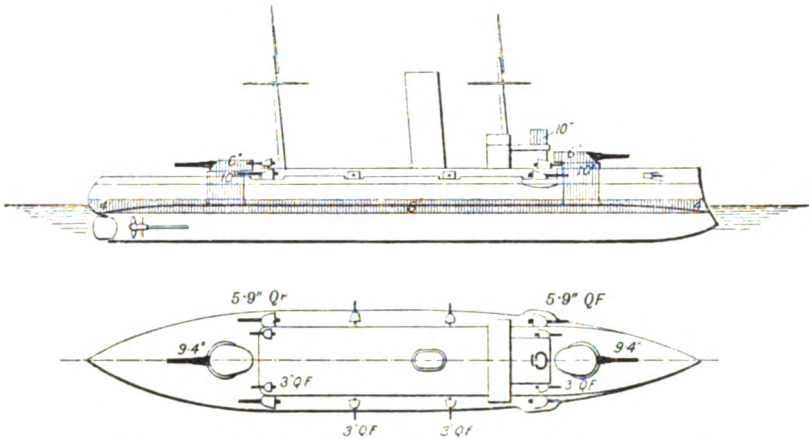
Fitted for Minelaying.

## NETHERLANDS.

## COAST DEFENCE SHIPS.

Hertog Hendrik

Marten Tromp.



Length, 317-330 ft. ; 5000-5216 tons ; Speed, 16 knots ; Completed, 1903-1906.

Armament : Hertog Hendrik : 2-9.4-in. ; 6-5.9-in. ; 4-3-in. ; 7 small.

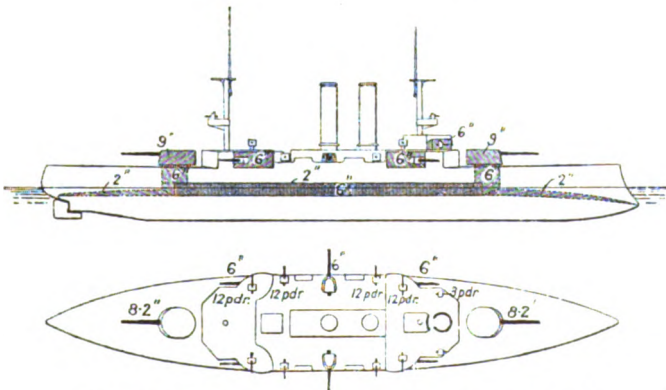
Marten Tromp : 2-9.4-in. ; 4-5.9-in. ; 8-3-in. ; 7 small.

## NORWAY.

## COAST DEFENCE SHIPS.

Norge

Eidsvold



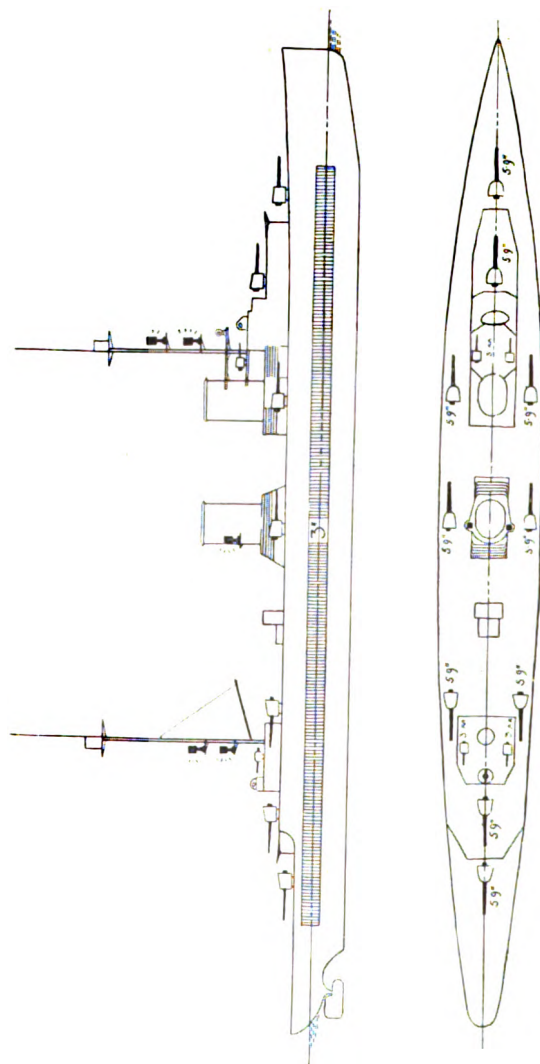
Length, 310 ft. ; 4,166 tons ; Speed, 16.9 knots ; Completed, 1901.

Armament, 2-8.2-in. ; 6-6-in. ; 8-3-in. ; 6-3-pr. ; 2 torpedo tubes.

NETHERLANDS.

CRUISERS.

Java. Sumatra.



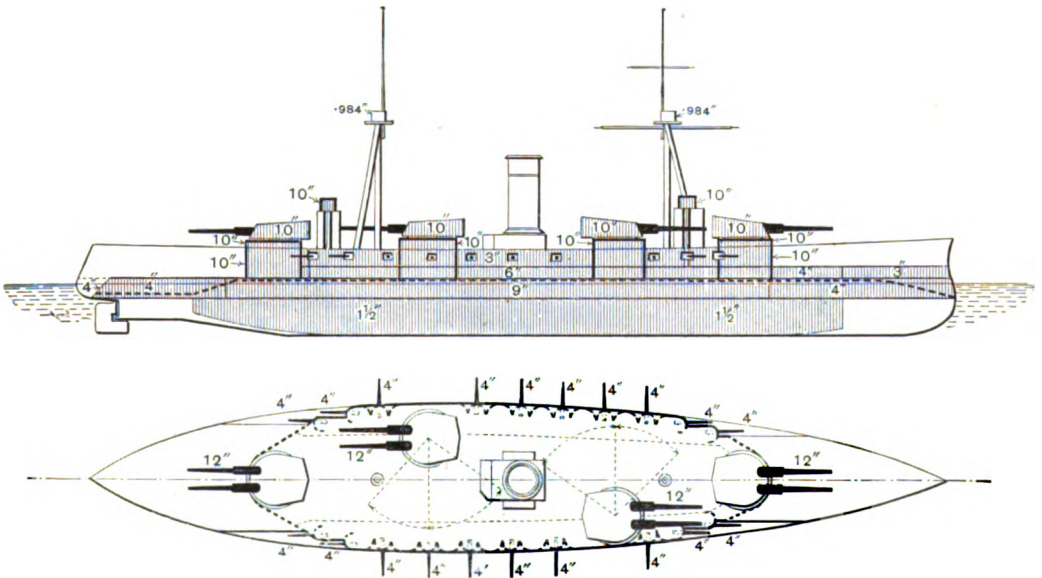
Length, 509½ ft. ; 6,030 tons ; Speed, 30 knots.  
Armament, 10—5.9 in. ; 4—3-in. A.A. ; 8 M.



**SPAIN.**

**BATTLESHIP.**

**Jaime I.**



Length (extreme), 459 ft. ; Length W. L., 435 ft. ; 14,224 tons ; Speed, 19·5 knots ; Completed, 1913-1916.  
Armament, 8—12-in. ; 20—4-in. ; 4—3-pr. ; 4—3 pr. A. A. ; 2 M.  
(Espana, 2—3-pr. ; 2 L. ; 2 M.)

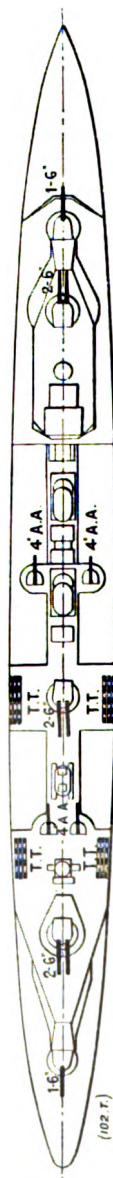
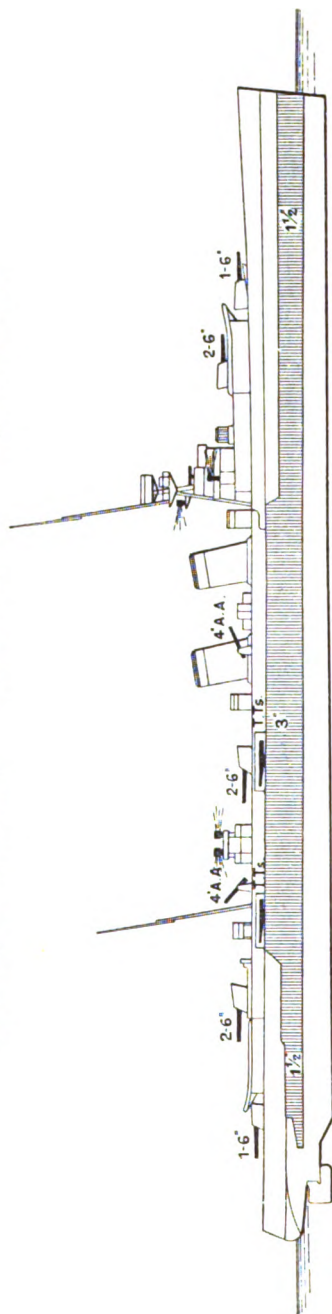
SPAIN.

**LIGHT CRUISERS.**

**Libertad (ex-Principe Alfonso).**

**Almirante Cervera.**

**Miguel de Cervantes.**

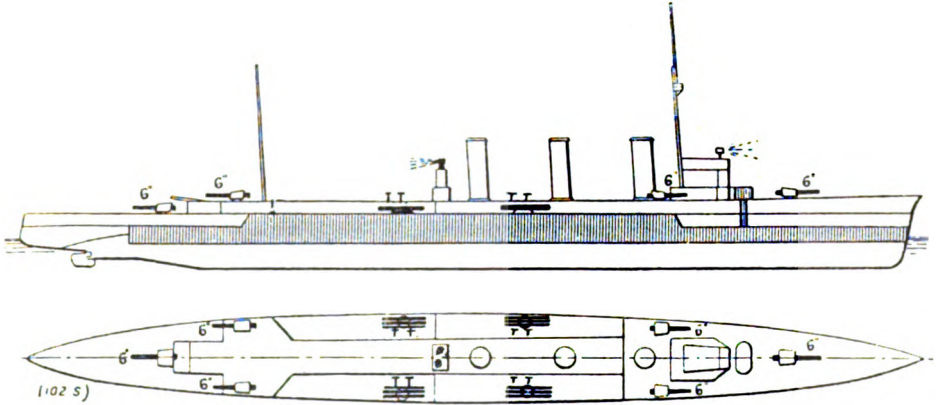


Length (extreme), 579 ft. 6 ins.; Length, B.P., 545 ft.; 7,475 tons; Speed, 33 knots.  
Armament, 8-6-in.; 4-4-in. A.A.; 2-3 pr.; 4 triple above-water torpedo tubes (21-in. torpedoes).  
Corrections to plan: The mainmast is tripod. There is no foretopmast.

SPAIN.

LIGHT CRUISER.

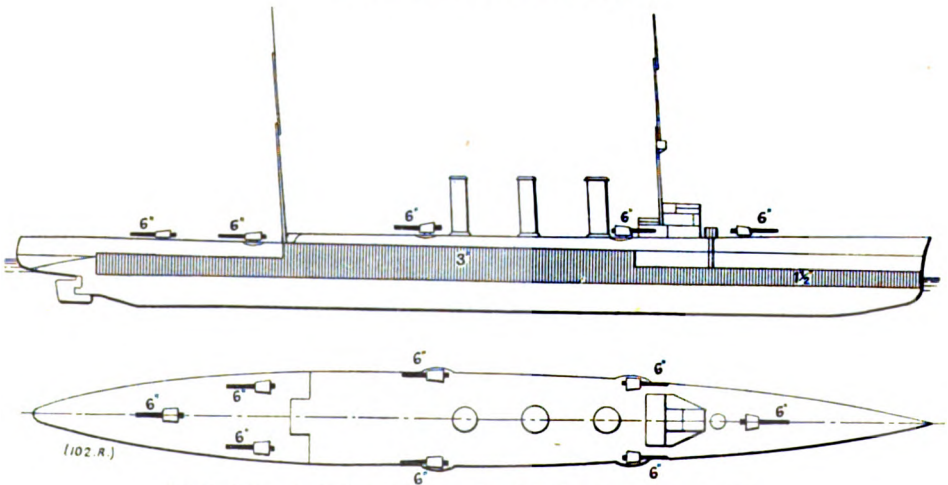
Mendez Nuñez.



Length (extreme), 462 ft. ; Length B.P., 439 ft. ; 4,509 tons ; Speed, 29 knots. Completed, 1924.  
Armament, 6—6-in. ; 4—3-pr. A.A. ; 4 M. ; 4 above-water triple torpedo tubes (21-in. torpedoes).

LIGHT CRUISER.

Republica (*ex-Reina Victoria Eugenia*).



Length (extreme), 462 ft. ; 4,857 tons ; Speed, 25½ knots ; Completed, 1922.  
Armament, 9\*—6-in. ; 1—3-in. ; 4—3-pr. A.A. ; 4 M. ; 1 L. ; 4 torpedo tubes.

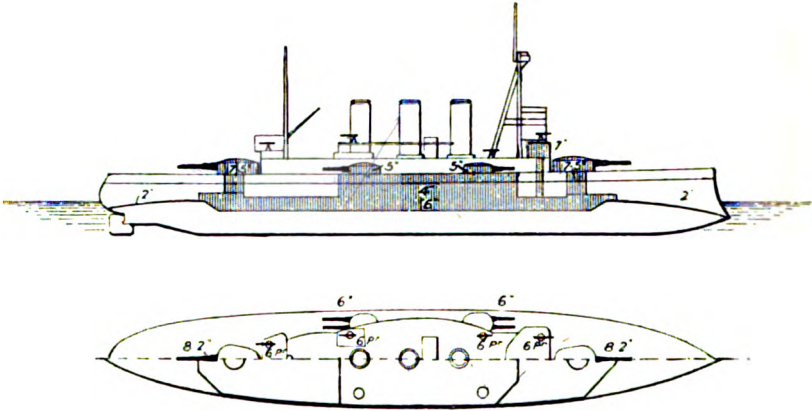
\* Correction to plan : There should be two 6-in. guns abreast forward instead of one on the centre line as shown.

( P92 )

SWEDEN.

BATTLESHIP.

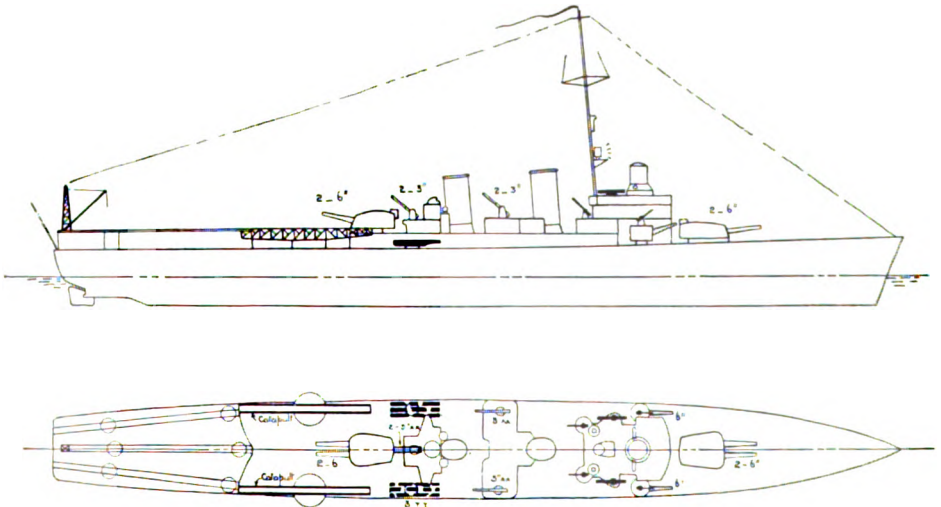
Oscar II.



Length, 313.6 ft. ; 4,085 tons ; Speed, 18 knots ; Completed, 1907.  
Armament, 2—8.2-in. ; 8—6-in. ; 8—6-pr. ; 1—1-pr. ; 2 torpedo tubes.

AIRCRAFT CRUISER.

Gotland.

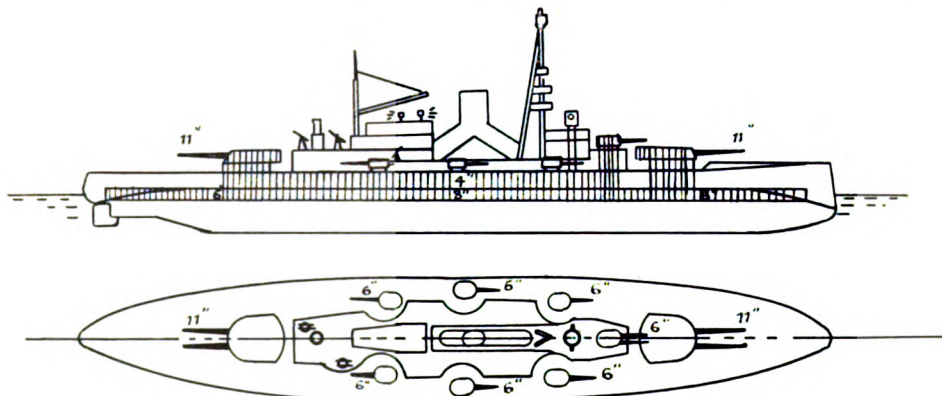


Length, 442 ft. ; 4,527 tons ; 33,000 H.P. ; Speed, 27 knots. Building.  
Armament, 6—6-in. ; 4—3-in. A.A. ; 4 M. ; 6—21-in. torpedo tubes.  
Correction to plan : 1 middle line catapult will be fitted instead of two.

SWEDEN.

COAST DEFENCE SHIPS.

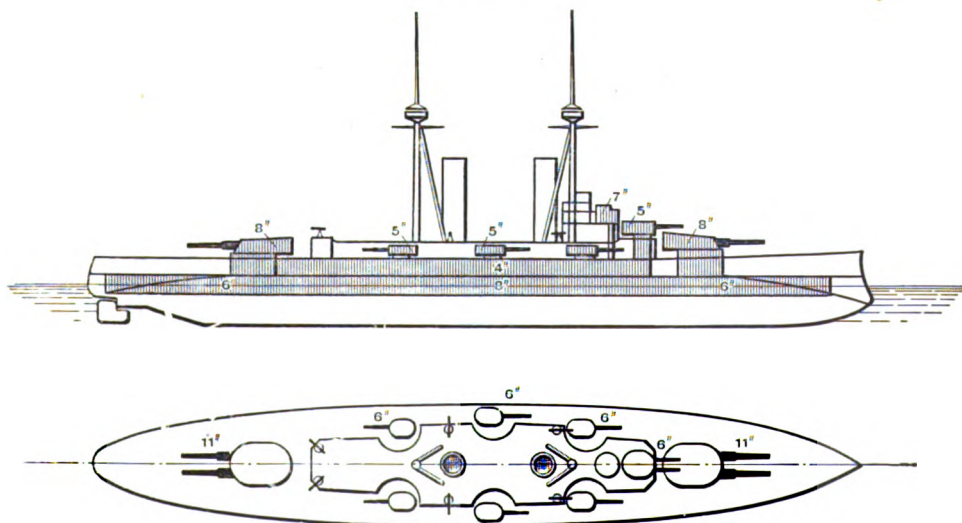
Gustav V. Sverige.  
(As reconstructed 1924-29.)



Length, 396.7 ft. ; 6,899 tons ; Speed, 22 knots ; Completed, 1917-1921.  
Armament, 4—11-in. ; 8—6-in. ; 6—3-in. ; 2—6-pr. ; 2 M.

COAST DEFENCE SHIP.

\*Drottning Victoria.



Length, 396.7 ft. ; 6,899 tons ; Speed, 23 knots ; Completed, 1921.  
Armament, 4—11-in. ; 8—6-in. ; 6—3-in. ; 2—6-pr. ; 2 M.

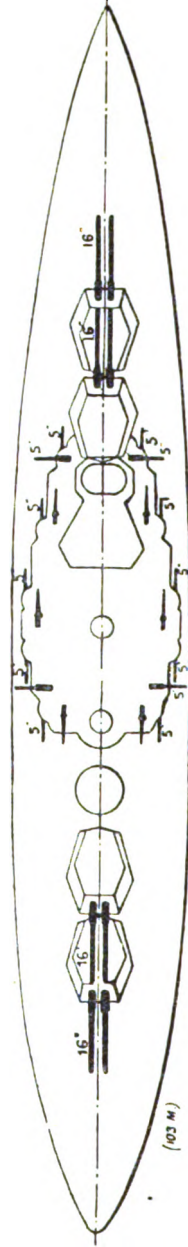
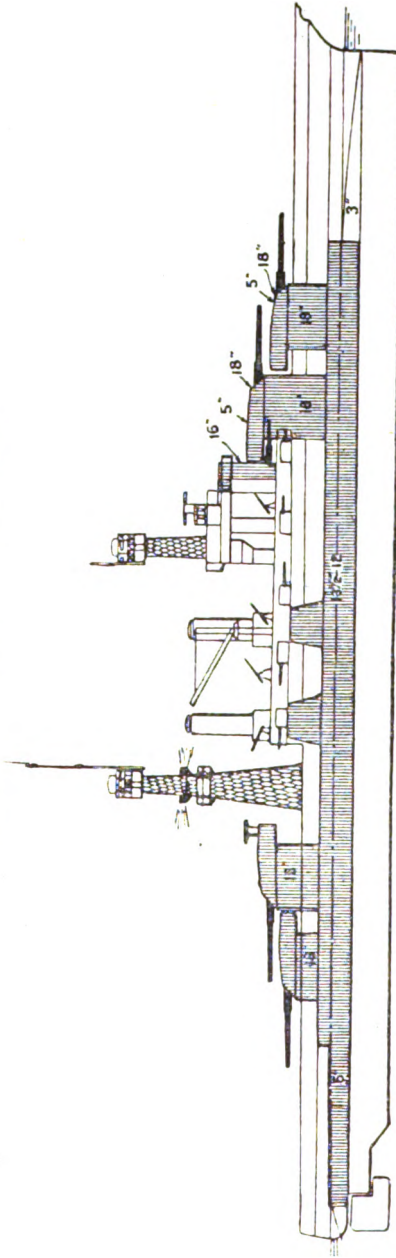
\* To be reconstructed and modernised as Gustav V and Sverige above.



## UNITED STATES.

## BATTLESHIPS.

Colorado. Maryland. West Virginia.



Length (extreme), 624 ft. ; Length W.L., 600 ft. ; Speed, 21 knots ; 32,600 tons ; Maryland, completed, 1921 ; Colorado and West Virginia, completed, 1923.

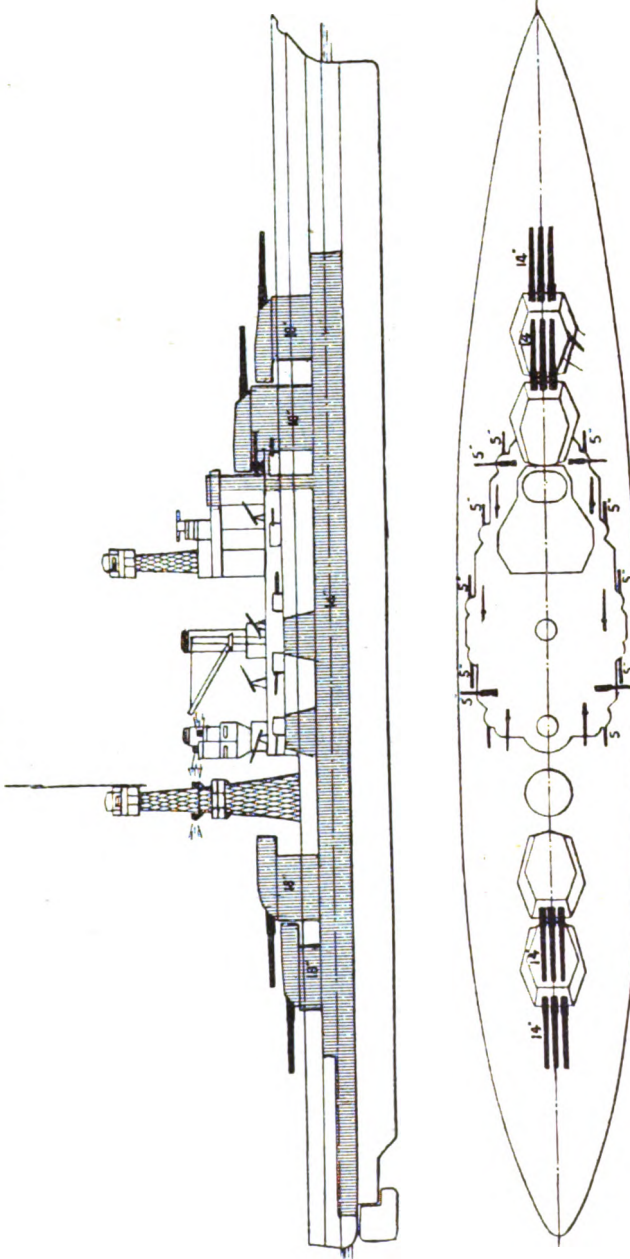
Armament, 8—16-in. ; 12—5-in. ; 8—5-in. A.A. ; 4—6-pr. ; 2 submerged 21-in. torpedo tubes. Catapult mounted right aft on Quarter Deck ; 3 aircraft.

## UNITED STATES

**BATTLESHIPS.**

**California.**

Tennessee.



Length (extreme) 624 ft.; Length W.L., 600 ft.; Speed, 21 knots; Completed, 1920-21. Armament, 12-14-in.; 12-6-in.; 8-5-in. A.A.; 4-6-pr.; 2-1-pr.; 2 submerged 21-in. torpedo tubes. 2 catapults (one right aft on Quarter Deck and one on the third turret); 3 seaplanes.



## UNITED STATES.

## BATTLESHIPS.

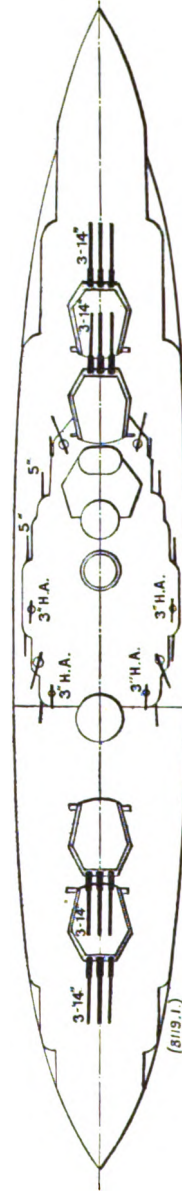
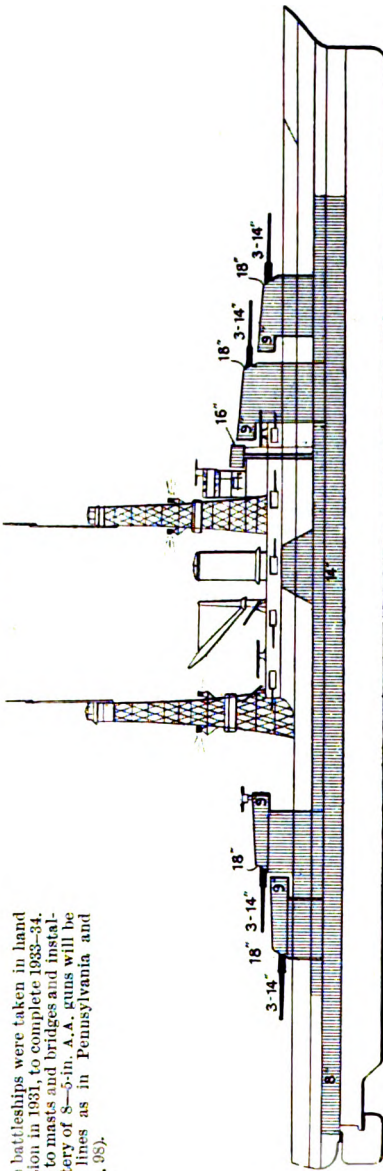
Idaho.

New Mexico.

Mississippi.

(Before modernisation.)

These three battleships were taken in hand for modernisation in 1931, to complete 1933-34. Alterations to masts and bridges and installation of a battery of 8-5-in. A.A. guns will be on the same lines as in Pennsylvania and Arizona (see p. 95).



Length (extreme), 624 ft. Length W.L., 600 ft. ; Speed, 21 knots ; 32,000 tons ; Completed, 1917-19. Armament, 12-14-in. ; 12-5-in. ; 8-3-in. A.A. ; 4-6-pr. ; 2 submerged 21-in. torpedo tubes.

\* Idaho, 4-3-pr.

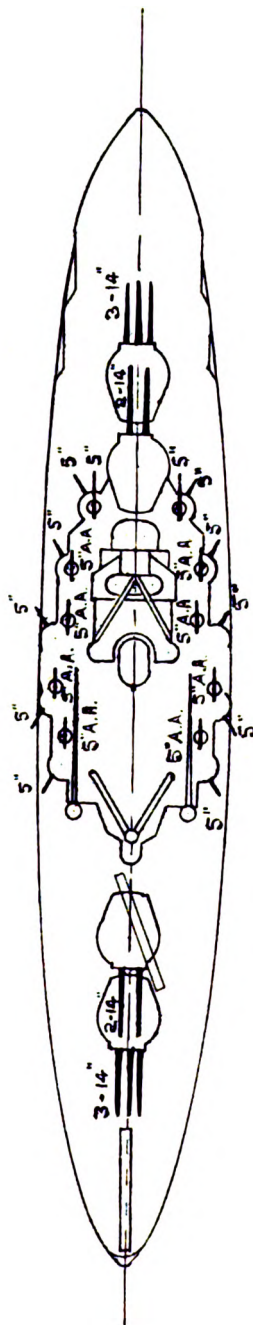
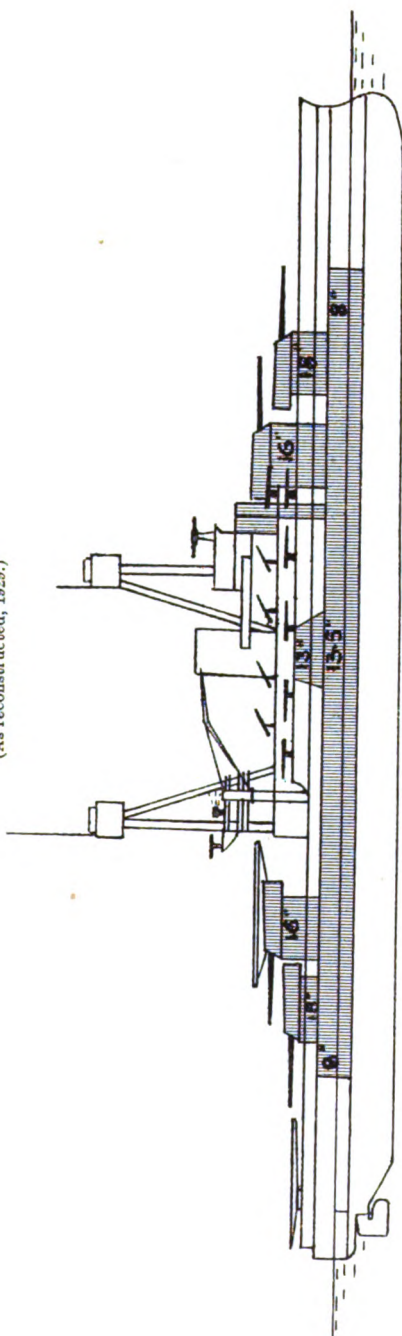
Catapult mounted right aft on Quarter Deck ; 3 aircraft.  
Mississippi has an additional turret catapult.

# UNITED STATES.

## BATTLESHIPS.

Nevada. Oklahoma.

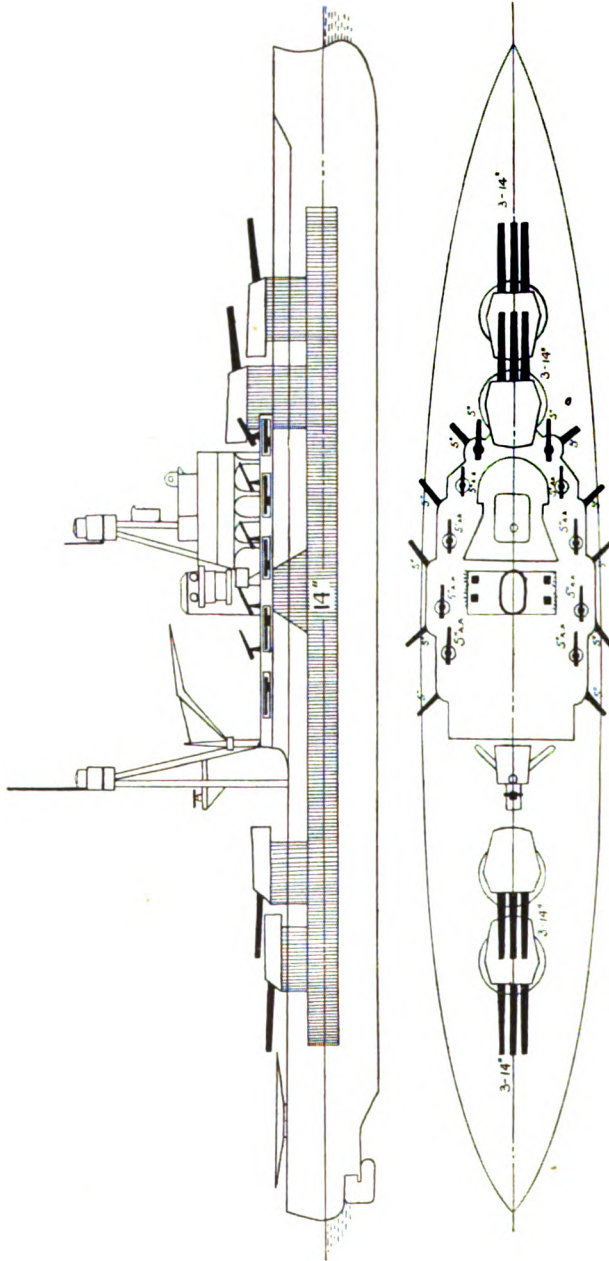
(As reconstructed, 1929.)



Length (extreme), 583 ft. ; Length W.L., 575 ft. ; Speed, 20.5 knots ; 27,500 tons.

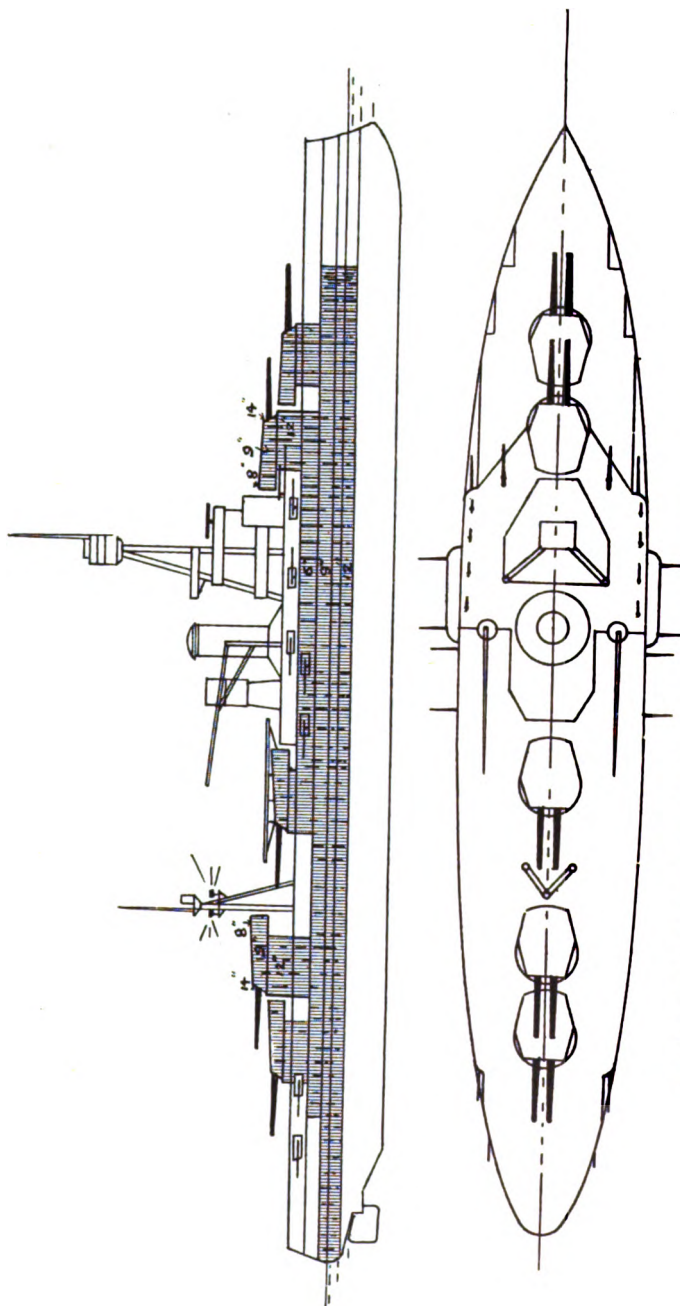
Armament, 10—14-in. ; 12—6-in. ; 8—5-in. A.A. ; 4—6-pr. (Oklahoma, 4—3-pr.) ; 2—1 pr. ; 2 M. ; 2 L. ; 2 catapults ; 3 aeroplanes.

UNITED STATES.  
BATTLESHIPS.  
Arizona. Pennsylvania.  
(As reconstructed 1931.)



Length (extreme) 608 ft. ; Length R.P., 596 ft. ; Speed, 21 knots ; Completed, 1916.  
Armament, 12-14-in. ; 12-5-in. ; 8-6-in. A.A. ; 4-8-pr. ; 2-1-pr. ; 2 M. ; 2 L. ; 2 catapults ; 3 aircraft.

UNITED STATES.  
BATTLESHIPS.  
New York. Texas.  
(As reconstructed 1927.)



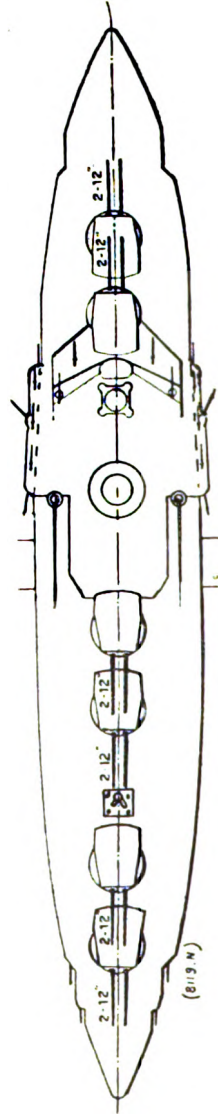
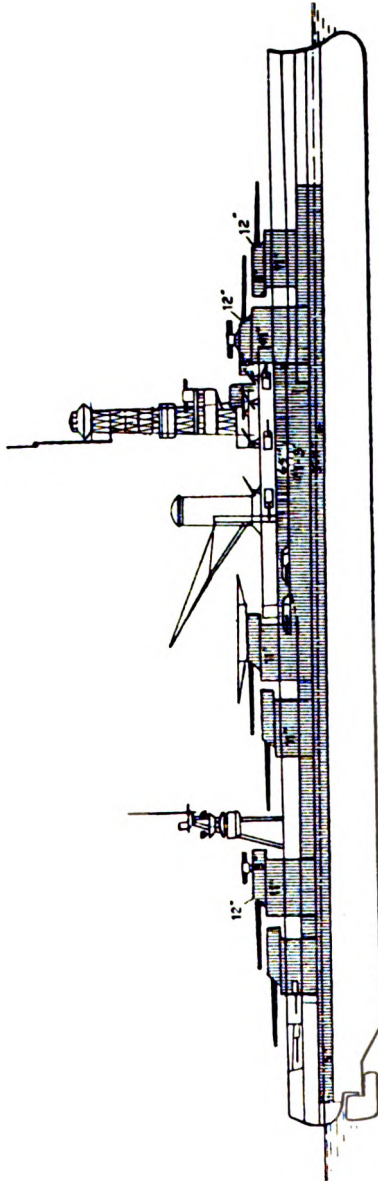
Length (extreme), 673 ft. ; Length W. L., 565 ft. ; Speed, 21 knots ; 27,000 tons ; Completed, 1914.  
Armament, 10—14-in. ; 16—5. in. ; 8—3-in. A.A. ; 4—3-pr. ; 2—1-pr. ; 2 M. ; 1 catapult ; 3 aircraft.

UNITED STATES.

BATTLESHIP.

Arkansas.

As reconstructed 1927.)



Length (extreme), 562 ft. ; Length W. L., 554 ft. ; Speed, 20.5 knots ; 26,100 tons ; Completed, 1912.  
Armament, 12-12-in. ; 16-5-in. ; 8-5-in. A.A. ; 4-3-pr. ; 2-1-pr. ; 2 M. ; 1 catapult ; 2 aircraft.

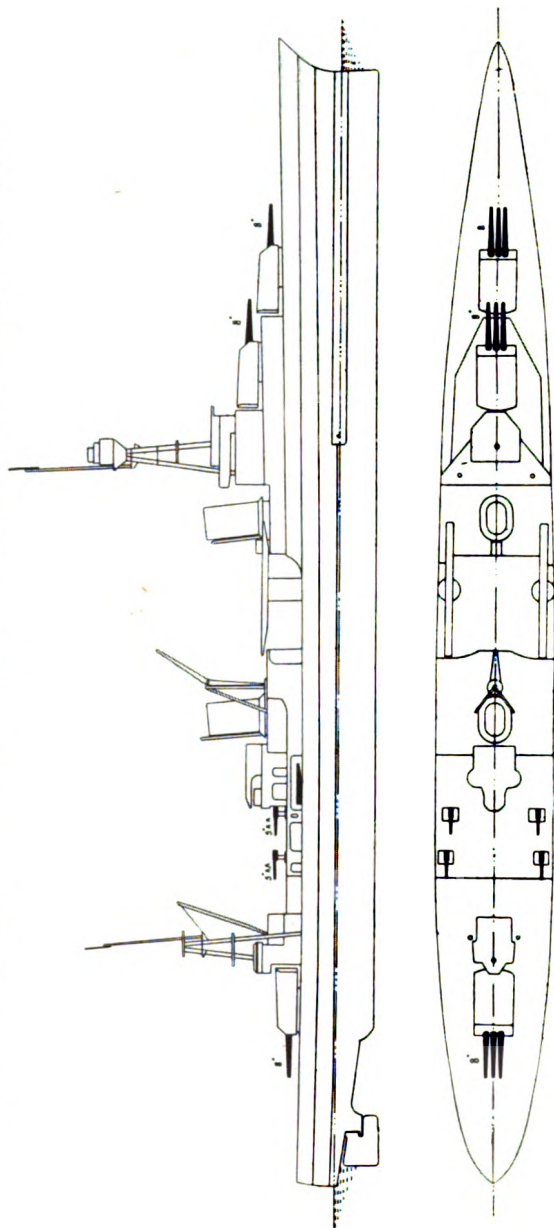
Wyoming, a sister ship, has been demilitarised and converted to a training ship.



## UNITED STATES:

## CRUISERS.

Northampton	Chester.	Louisville.	Chicago.	Houston.	Augusta.
Portland.*	New Orleans.*	Astoria.*	Minneapolis.*	San Francisco.*	Tuscaloosa.*
Indianapolis.*					



Length (extreme), 600 ft. ; 9,050-9,300 tons ; Speed, 32.5 knots.

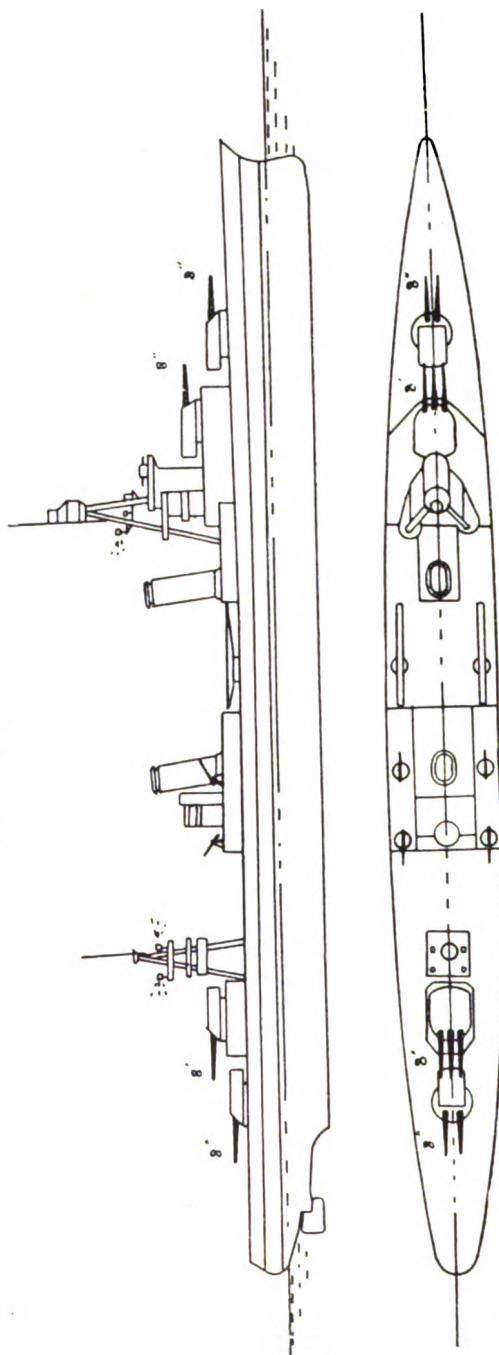
Armament, 9-8-in. ; 4-5-in. A.A. ; 2 catapaults ; 4 seaplanes.

\* These later cruisers (10,000 tons displacement) which are still building are reported to be generally similar to above, but have 8-5-in. A.A. guns and side armour protection. All except Portland and Indianapolis have no mainmasts, and "block" bridges instead of tripod foremasts.

UNITED STATES.

CRUISERS.

Salt Lake City. Pensacola.



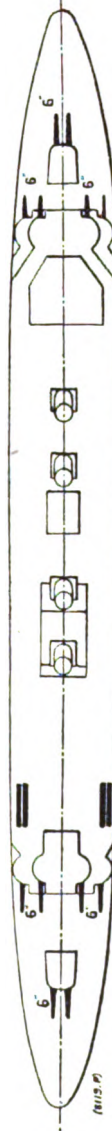
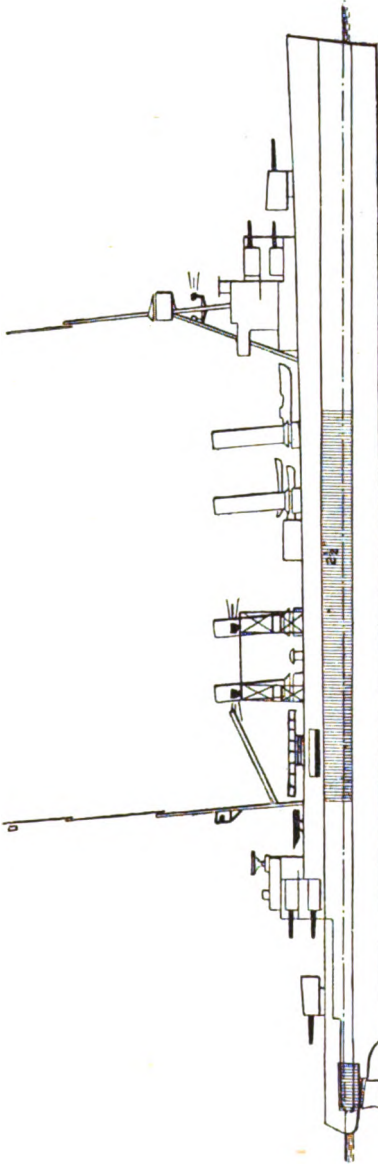
Length (extreme), 585½ ft. ; 9,100 tons ; Speed, 32½ knots.  
Armament, 10-8-in. ; 4-5-in. A.A. ; 2-3-pr. ; 2 triple torpedo tubes.  
2 catapults ; 4 seaplanes.



## UNITED STATES.

## SCOUT CRUISERS.

Cincinnati.	Concord.	Detroit. Raleigh.	Marblehead. Richmond.	Memphis. Trenton.	Milwaukee.	Omaha.
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Length (extreme), 555 ft. 6 ins. ; Length W.L., 550 ft. ; Speed, 33.7 knots ; 7,050 tons. Completed in 1923-25.  
 Armament, 12-6-in. (Marblehead, 11-6-in. ; Cincinnati, Detroit, Raleigh and Richmond, 10-6-in.) ; 4-3-in. A.A. ; 2-3-pr. ; 2 triple above-water  
 21-in. torpedo tubes ; 2 catapults ; 2 aeroplanes.

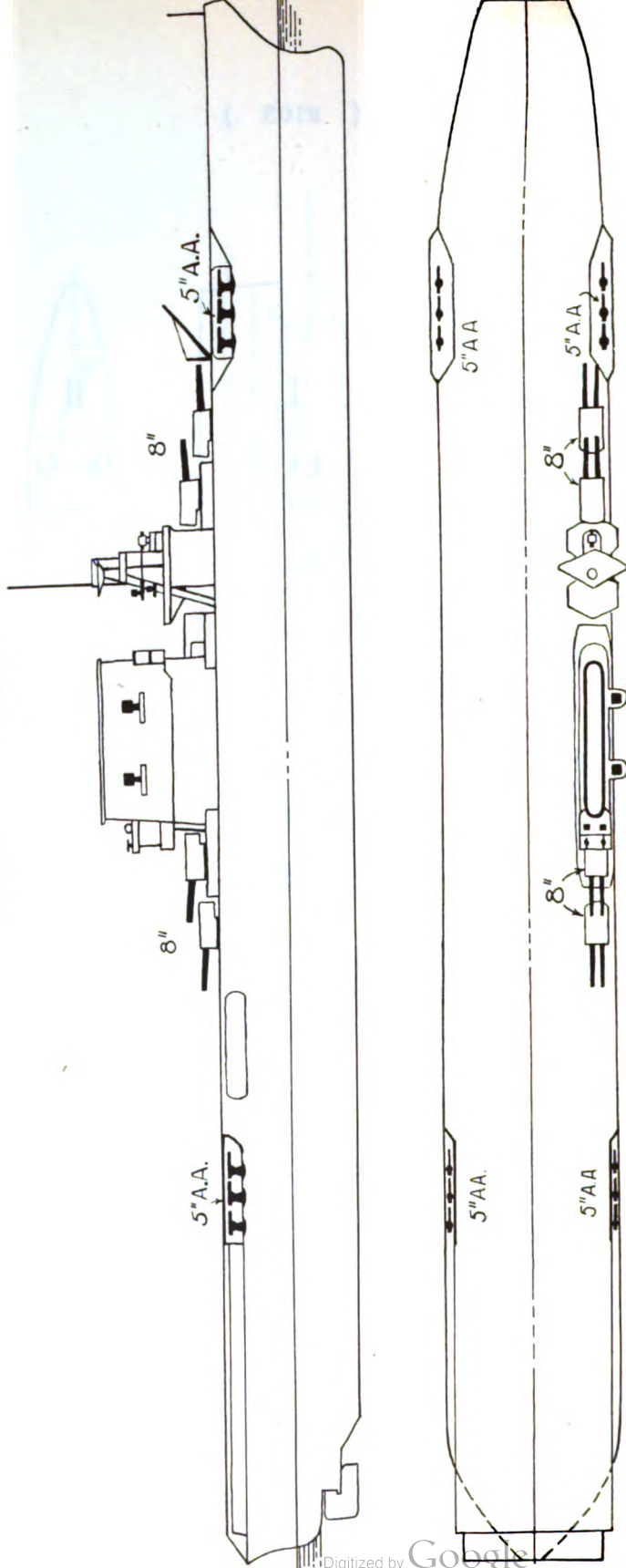
The pair of single 6-in. guns at upper deck level aft are removed in Cincinnati, Detroit, Raleigh and Richmond.

## UNITED STATES.

## AIRCRAFT CARRIERS.

Lexington.

Saratoga.



Length (extreme), Lexington, 880 ft. ; Saratoga, 888 ft. ; 33,000 tons ; Speed, 33½ knots.  
 Armament, 8—8-in. ; 12—5-in. A.A. ; 4—0-pr. ; 70 to 80 aircraft.

PROFILES OF  
MERCHANT SHIPS.



MERCHANT SHIPS.



**AQUITANIA.** Cunard. Length, 868 ft. 7 ins. ; Gross Tonnage, 45,647  
Funnels : Red, Black Tops.



**OLYMPIC.** White Star. Length, 852 ft. 5 ins. ; Gross Tonnage, 46,439 ;  
Funnels : Buff, Black Tops.



**MAURETANIA.** Cunard. Length, 762 ft. 2 ins. ; Gross Tonnage, 30,696 ;  
Funnels : Red, Black Tops.



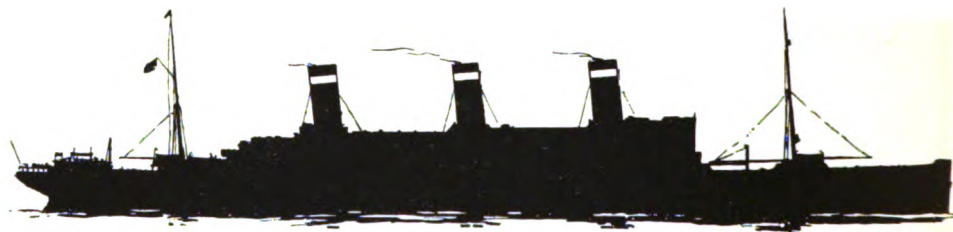
**FRANCE.** Cie. Générale Transatlantique. Length, 690 ft. 1 in. ; Gross Tonnage, 23,769  
Funnels : Red, Black Tops.



**ARUNDEL CASTLE.** WINDSOR CASTLE. Union Castle. Length, 630 ft. 5 ins. and 632 ft. 4 ins.  
Gross Tonnage, 19,023 and 18,967 ;  
Funnels : Red, Black Tops.



**MAJESTIC.** White Star. Length, 915 ft. 5 ins. ; Gross Tonnage, 56,621 ;  
Funnels : Buff, Black Tops.



**LEVIATHAN.** United States Lines. Length, 907 ft. 6 ins. ; Gross Tonnage, 48,043 ;  
Funnels : Red, White Band, Blue Tops.



**BERENGARIA.** Cunard. Length, 883 ft. 6 ins. ; Gross Tonnage, 52,226 ;  
Funnels : Red, Black Tops.



**ILE DE FRANCE.** Cie. Générale Transatlantique. Length, 763 ft. 7 ins. ; Gross Tonnage, 43,153 ;  
Funnels : Red, Black Tops.



**PARIS.** Cie. Générale Transatlantique. Length, 735 ft. 4 ins. ; Gross Tonnage, 34,569 ;  
Funnels : Red, Black Tops.





**EMPRESS OF BRITAIN.** Canadian Pacific. Length, 733 ft. 3 ins.;  
Gross Tonnage, 42,348;  
Funnels: Yellow.



**L'ATLANTIQUE.** Cie. Sud Atlantique. Length, 713 ft. 6 ins.;  
Gross Tonnage, 42,512;  
Funnels: Buff, Black Tops.  
(Destroyed by fire on January 5, 1933.)



**BELGENLAND.** Red Star. Length, 670 ft. 4 ins.; Gross Tonnage, 27,132;  
Funnels: Black, White Band.



**STATENDAM.** Holland-Amerika. Length, 670 ft. 4 ins.; Gross Tonnage, 29,511;  
Funnels: Buff, White Band between Two Green.



**EMPRESS OF JAPAN.** Canadian Pacific. Length, 644 ft. Gross Tonnage, 26,032;  
Funnels, Buff.





**STRATHNAVER. STRATHAIRD.** *Peninsular and Oriental.*  
Length, 638 ft. 7 ins. and 638 ft.; Gross Tonnage, 22,547 and 22,544;  
Funnels: Yellow. Hulls: White.



**CAP POLONIO.** *Hamburg-South Amerika.* Length, 637 ft. 8 ins.; Gross Tonnage, 21,011;  
Funnels: White, Red Tops.



**EMPRESS OF CANADA.** *Canadian Pacific.* Length, 627 ft.; Gross Tonnage, 21,517;  
Funnels: Yellow.



**RELIANCE. RESOLUTE.** *Hamburg-Amerika Line.* Length, 590 ft. 4 ins.;  
Gross Tonnage, 19,821 and 19,464;  
Funnels: Yellow, with Black, White and Red Bands at Top.



**EMPRESS OF AUSTRALIA.** *Canadian Pacific.* Length, 589 ft. 9 ins.; Gross Tonnage, 21,833;  
Funnels: Yellow.



**NALDERA.** *Peninsular and Oriental.* Length, 580 ft. 9 ins.; Gross Tonnage, 16,088;  
**NARKUNDA.** " " Length, 581 ft. 4 ins.; Gross Tonnage, 16,572;  
Funnels: Black.

(The Narkunda is similar to the Naldera but has raised forecastle.)



**LUTETIA.** Cie. Sud Atlantique. Length, 579 ft. ; Gross Tonnage, 14,783 ;  
Funnels : Buff, Black Tops.



**MASSILIA.** Cie. Sud Atlantique. Length, 577 ft. 1 in. ; Gross Tonnage, 15,363 ;  
Funnels : Buff, Black Tops.



**EMPRESS OF ASIA. EMPRESS OF RUSSIA.** Canadian Pacific.  
Length, 570 ft. ; Gross Tonnage, 16,909 and 16,810 ;  
Funnels : Yellow.



**MONARCH OF BERMUDA.** Furness Withy. Length, 553 ft. 2 ins. ;  
Gross Tonnage, 22,424 ;  
Funnels : Black, Red, Thin Black and Red Bands, Black Tops.



**TRANSYLVANIA. CALEDONIA.** Anchor Henderson.  
Length, 552 ft. 4 ins. and 553 ft. ; Gross Tonnage, 16,923 and 17,046 ;  
Funnels : Black.



**CHAMPOLLION. MARIETTE PACHA.** Messageries Maritimes.  
Length, 495 ft. 1 in. and 508 ft. 5 ins. ; Gross Tonnage, 12,263 and 12,239 ;  
Funnels : Black.



**TAIREA. TAKLIWA. TALAMBA.** British India S.N. Co.  
Length, 449 ft. 6 ins. ; Gross Tonnage, 8,000 ;  
Funnels : Black, Two White Bands, Black Tops.



**PRINCE DAVID. PRINCE HENRY. PRINCE ROBERT.** Canadian National Railways.  
Length, 366 ft. 4 ins. ; Gross Tonnage, 6,892.



**PRINCESS KATHLEEN. PRINCESS MARGUERITE.** Canadian Pacific.  
Length, 350 ft. ; Gross Tonnage, 5,875 ;  
Funnels : Yellow, Black Top.



**CIUDAD DE BUENOS AIRES. Argentine S.N. Co. CIUDAD DE MONTE VIDEO.**  
Uruguayan S.N. Co. Length, 350 ft. ; Gross Tonnage, 3,864 ;  
Funnels : Yellow, Black Tops.



**PRINCESS ELAINE.** Canadian Pacific. Length 291 ft. ; Gross Tonnage, 2,000 ;  
Funnels : Yellow, Black Top.



**BREMEN. EUROPA. Norddeutscher Lloyd.** Length, 898 ft. 7 ins. and 890 ft. 2 ins.;  
Gross Tonnage, 51,656 and 49,746;  
Funnels: Yellow.



**REX. Italia Line.** Length, 833 ft. 8 ins.; Gross Tonnage, 50,100;  
Funnels: Red, White and Green Stripes.



**CONTE DI SAVOIA. Italia Line.** Length, 790 ft.; Gross Tonnage, 46,000;  
Funnels: Red, White and Green Stripes.



**HOMERIC. White Star.** Length, 751 ft.; Gross Tonnage, 34,351;  
Funnels: Buff, Black Tops.



**COLUMBUS. Norddeutscher Lloyd.** Length, 749 ft. 6 ins.; Gross Tonnage, 32,565;  
Funnels: Yellow.



**ADRIATIC. BALTIC. White Star.** Length, 709 ft. 2 ins. ;  
Gross Tonnage, 24,679 and 23,884 ;  
Funnels : Buff, Black Tops.



**GEORGE WASHINGTON. United States Shipping Board.** Length, 699 ft. 1 in. ;  
Gross Tonnage, 23,788 ;  
Funnels : Red, White Band, Blue Top.



**M.S. BRITANNIC. M.S. GEORGIC. White Star.** Length, 683 ft. 6 ins. ; Gross Tonnage,  
26,943 and 27,759 ;  
Funnels : Buff, Black Tops.



**MANHATTAN. United States Lines.** Length, 668 ft. 4 ins. ; Gross Tonnage, 24,289 ;  
Funnels : Red, White Band, Blue Tops.



**M.S. AUGUSTUS. Italia Line.** Length, 666 ft. 3 ins. ;  
Gross Tonnage, 32,650 ;  
Funnels : Red, White and Green Stripes.





**ROMA.** Italia Line. Length, 664 ft. 7 ins. ; Gross Tonnage, 32,583 ;  
Funnels : Red, White and Green Stripes.



**CONTE GRANDE. CONTE BIANCAMANO.** Italia Line.  
Length, 652 ft. 2 ins. and 650 ft. 9 ins. ; Gross Tonnage, 25,661 and 24,416 ;  
Funnels : Red, White and Green Stripes.



**ROTTERDAM.** Holland-Amerika. Length, 650 ft. 5 ins. ; Gross Tonnage, 24,149 ;  
Funnels : Buff, Two Green Bands with White Band between, Buff Tops.



**ORFORD. ORAMA. ORONSAY. ORONTES. OTRANTO.** Orient. Length, 632 ft. ;  
Gross Tonnage, about 20,000 ;  
Funnels : Cream.



**M.S. WARWICK CASTLE. M.S. WINCHESTER CASTLE. M.S. CARNARVON CASTLE.** Union Castle Line. Length, 651 ft. 5 ins., 631 ft. 6 ins., and 630 ft. 7 ins. ;  
Gross Tonnage, 20,445, 20,109, and 20,063 ;  
Funnels : Red, Black Tops.



**M.S. ALCANTARA. M.S. ASTURIAS. Royal Mail.**  
Length, 630 ft. 5 ins. ; Gross Tonnage, 22,181 and 22,071 ;  
Funnels : Buff.



**PRESIDENT HOOVER. PRESIDENT COOLIDGE. Dollar Steamship Lines.**  
Length, 615 ft. ; Gross Tonnage, 21,936 ;  
Funnels : Black, White \$ on Red Band.



**LAPLAND. Red Star.** Length, 605 ft. 8 ins. ; Gross Tonnage, 18,866 ;  
Funnels Black, White Band.



**ALBERT BALLIN. DEUTSCHLAND. Hamburg-Amerika Line.** Length, 602 ft. 4 ins.  
Gross Tonnage, 20,931 and 20,742 ;  
Funnels : Yellow, with Black, White and Red Band at Tops.



**NEW YORK. HAMBURG. Hamburg-Amerika Line.** Length, 602 ft. 5 ins. ;  
Gross Tonnage, 21,867 and 21,691 ;  
Funnels : Yellow, with Black, White and Red Band at Tops.

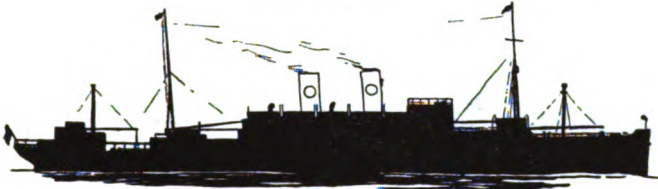


**DUILIO. GIULIO CESARE. Italia Line.** Length, 602 ft. 4 ins. ;  
Gross Tonnage, 24,281 and 21,657 ;  
Funnels : Red, White and Green Stripes.





**MOOLTAN. MALOJA.** Peninsular and Oriental. Length, 600 ft. 8 ins. ;  
Gross Tonnage, 20,952 and 20,914 ;  
Funnels : Black.



**M.S. KUNGSHOLM.** Swedish American Line. Length, 594, ft. 9 ins. ;  
Gross Tonnage, 20,223 ;  
Funnels : Yellow, Blue Discs on Sides.



**ALBERTIC.** White Star. Length, 590 ft. 8 ins. ; Gross Tonnage, 18,940 ;  
Funnels : Buff, Black Tops.



**VIRGINIA. CALIFORNIA.** American S.S. Corporation. Length, 586 ft. 4 ins.  
and 574 ft. 4 ins. ; Gross Tonnage, 20,773 and 20,325 ;  
Funnels : Black, White Band.



**VICEROY OF INDIA.** Peninsular and Oriental. Length, 582 ft. 7 ins. ;  
Gross Tonnage : 19,648 ;  
Funnels : Black.



**DUCHESS OF ATHOLL. DUCHESS OF BEDFORD. DUCHESS OF RICHMOND.**  
**DUCHESS OF YORK.** Canadian Pacific. Length, 581 ft. 9 ins. ;  
Gross Tonnage, 20,123 to 20,021 ;  
Funnels : Yellow.



**ORMONDE.** Orient Line. Length, 580 ft. 5 ins. ; Gross Tonnage, 14,982 ;  
Funnels : Cream.



**M.S. AORANGI.** Canadian-Australasian Line. Length, 580 ft. ; Gross Tonnage, 17,491 ;  
Funnels : Red, Black Tops.



**M.S. MARNIX VAN ST. ALDEGONDE. M.S. JOHAN VAN OLDENBARNEVELT.**  
Stoomvaart Maatschappij Nederland. Length, 580 ft. ;  
Gross Tonnage, 19,129 and 19,040 ;  
Funnels : Buff, Black Tops.



**LAURENTIC.** White Star. Length, 578 ft. 2 in. ; Gross Tonnage, 18,724 ;  
Funnels : Buff, Black Tops.



**DORIC.** White Star. Length, 575 ft. 5 ins. ; Gross Tonnage, 16,484 ;  
Funnels : Buff, Black Tops.

**WESTERLAND. PENNLAND.** Red Star. Length, 575 ft. 3 ins. ;  
Gross Tonnage, 16,500 and 16,322 ;  
Funnels : Black, White Band.



**EMPRESS OF FRANCE.** Canadian Pacific. Length, 571 ft. 4 ins. ; Gross Tonnage, 18,452 ;  
Funnels : Yellow.



**SAXON.** Union Castle Line. Length, 570 ft. 5 ins.; Gross Tonnage, 12,385;  
Funnels: Red, Black Tops.



**CONTE VERDE.** CONTE ROSSO. Italia Line. Length, 570 ft. 2 ins.;  
Gross Tonnage, 18,765 and 17,048;  
Funnels: Red, White and Green Stripes.



**ARMADALE CASTLE.** KENILWORTH CASTLE. Union Castle Line.  
Length, 570 ft. 1 in.; Gross Tonnage, 12,973 and 12,975;  
Funnels: Red, Black Tops.



**BALMORAL CASTLE.** EDINBURGH CASTLE. Union Castle Line.  
Length, 570 ft.; Gross Tonnage, 13,361 and 13,330;  
Funnels: Red, Black Tops.



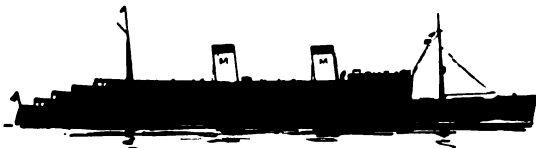
**M.S. CHICHIBU MARU.** M.S. TATSUTA MARU. M.S. ASAMATMARU. Nippon  
Yusen Kaisha. Length, 560 ft.; Gross Tonnage, 17,498 to 16,975;  
Funnels: Black, Broad White Band, Two Red on White.



**ROCHAMBEAU.** Cie. Générale Transatlantique.  
Length, 559 ft. 4 ins.; Gross Tonnage, 12,678;  
Funnels: Red, Black Tops.



**SHINYO MARU.** Nippon Yusen Kaisha. Length, 558 ft.; Gross Tonnage, 13,026;  
Funnels: Black, Broad White Band, Two Red on White.



**MALOLO.** Matson Line. Length, 554 ft.; Gross Tonnage, 17,232;  
Funnels: Yellow, Black Tops, "M" on sides.



**M.S. GRIPSHOLM.** Swedish American Line. Length, 553 ft.; Gross Tonnage, 17,716;  
Funnels: Yellow, Blue Discs on Sides.



**DE GRASSE.** Cie. Générale Transatlantique. Length, 552 ft. 1 in.; Gross Tonnage, 18,435;  
Funnels: Red, Black Tops.



**M.S. REINA DEL PACIFICO.** Pacific Steam Navigation Co.  
Length, 551 ft.; Gross Tonnage, 17,707;  
Funnels: Buff.



**VEENDAM.** VOLENDAM. Holland-America Line. Length, 550 ft. 2 ins.;  
Gross Tonnage, 15,450 and 15,434;  
Funnels: Buff, White Band between Two Green.



**DRESDEN.** Norddeutscher Lloyd. Length, 550 ft.; Gross Tonnage, 14,690;  
Funnels: Yellow.



**MONTCLARE.** Canadian Pacific.  
Length, 549 ft. 6 ins.; Gross Tonnage, 16,418 to 16,314;  
Funnels: Yellow.



**RANCHI.** Peninsular and Oriental.  
Length, 548 ft.; Gross Tonnage, 16,738 to 16,644;  
Funnels: Black.



**M.S. ST. LOUIS.** Hamburg-Amerika. Length, 543 ft. 8 ins. and  
546 ft. 6 ins.;  
Gross Tonnage, 16,712 and 16,690;  
Funnels: Yellow, with Black, White and Red Bands at Tops.



**D'ARTAGNAN.** Messageries Maritimes. Length, 543 ft. 5 ins.;  
Gross Tonnage, 15,105;  
Funnels: Black.



**M.S. ARAMIS.** Messageries Maritimes. Length, 542 ft. 6 ins.; Gross Tonnage, 15,500;  
Funnels: Black.



**GELRIA.** Holland Lloyd. Length, 541 ft. ; Gross Tonnage, 13,868 ;  
Funnels : Yellow, Black Band.



**M.S. VICTORIA.** Lloyd Triestino. Length, 540 ft. 6 ins. ;  
Gross Tonnage, 13,068 ;  
Funnels : Black.



**MALWA.** MANTUA. Peninsular and Oriental. Length, 540 ft. ;  
Gross Tonnage, 10,986 and 10,946 ;  
Funnels : Black.



**NIEUW ZEELAND.** NIEUW HOLLAND. Koninklijke Paketvaart Maatschappij.  
Length, 540 ft. ; Gross Tonnage, 11,060 and 11,057 ;  
Funnels : Buff, narrow Black Top.



**ORSOVA.** Orient Line. Length, 536 ft. 2 ins. ; Gross Tonnage, 12,041 ;  
Funnels : Cream.



**M.S. FÉLIX ROUSSEL.** Messageries Maritimes. Length, 534 ft. 8 ins. ;  
Gross Tonnage, 16,741 ;  
Funnels : Black.



**STAVANGERFJORD.** *Norske Amerika Linie.* Length, 532 ft. 5 ins.; Gross Tonnage, 13,156;  
Funnels: Yellow, Two Red and Two White Bands with Blue Band between.



**M.S. RANGITATA. RANGITANE. RANGITIKI.** *New Zealand Shipping Co.*  
Length, 531 ft.; Gross Tonnage, 16,737, 16,712, and 16,698;  
Funnels: Yellow.



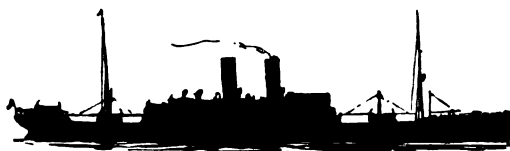
**CHITRAL. COMORIN. CATHAY.** *Peninsular and Oriental.*  
Length, 526 ft. 3 in., 523 ft. 5 ins. and 523 ft. 5 ins. Gross Tonnage, 15,396, 15,279, and 15,272;  
Funnels: Black.



**NIAGARA.** *Canadian-Australasian Line.* Length, 524 ft. 7 ins.; Gross Tonnage, 13,415;  
Funnels: Red, Black Tops.



**M.S. HIGHLAND MONARCH. HIGHLAND CHIEFTAIN. HIGHLAND BRIGADE.  
HIGHLAND PRINCESS. HIGHLAND PATRIOT.** *Royal Mail (Nelson).*  
Length, 523 ft. 4 ins.; Gross Tonnage, 14,157 to 14,128;  
Funnels: Cream.

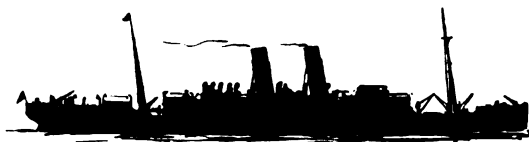


**FREDERIK VIII.** *Det Forenede Damskibs Selskab.* Length, 523 ft. 5 ins.;  
Gross Tonnage, 11,850;  
Funnels: Black, Red Band.





**CORFU. CARTHAGE.** *Peninsular and Oriental.* Length, 522 ft. 5 ins. ;  
Gross Tonnage, 14,293 and 14,304 ;  
Funnels: Black.



**KAISAR-I-HIND.** *Peninsular and Oriental.* Length, 520 ft. ; Gross Tonnage, 11,518 ;  
Funnels: Black.



**MINNEDOSA. MELITA.** *Canadian Pacific.* Length, 520 ft. ; Gross Tonnage, 15,186  
and 15,183.  
Funnels: Yellow.



**BERGENSFJORD.** *Norske Amerika Linie.* Length, 512 ft. 4 ins. ; Gross Tonnage, 11,015 ;  
Funnels: Yellow, Two Red and Two White Bands with Blue Band between.



**ARANDORA STAR.** *Blue Star Line.* Length, 512 ft. 2 ins. ; Gross Tonnage, 14,694 ;  
Funnels: Red, Black Tops and White Band, Blue Star on White Disc.



**AVILA STAR. AVELONA STAR. ALMEDA STAR. ANDALUCIA STAR.** *Blue Star Line.*  
Length, 510 ft. 2 ins. to 512 ft. 2 ins. ; Gross Tonnage, 12,872 to 12,846 ;  
Funnels: Red, Black Tops and White Band, Blue Star on White Disc.



**PORTHOS.** Messageries Maritimes. Length, 510 ft. 8 ins. ; Gross Tonnage, 12,692  
Funnels : Black.



**ANDRE LEBON.** Messageries Maritimes. Length, 508 ft. 2 ins. ; Gross Tonnage, 13,682 ;  
Funnels : Black.



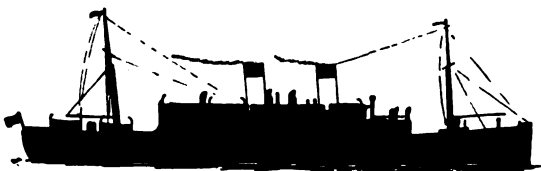
**GADELOUPE.** Cie. Générale Transatlantique. Length, 508 ft. 4 ins. ;  
Gross Tonnage, 10,502 ;  
Funnels : Red, Black Tops.



**METAGAMA.** Canadian Pacific. Length, 500 ft. 4 ins. ; Gross Tonnage, 12,420 ;  
Funnels : Yellow.



**MONOWAI.** Union Royal Mail Line. Length, 500 ft. 4 ins. ;  
Gross Tonnage, 10,852 ;  
Funnels : Red, Black Tops.



**M.S. MONTE ROSA. M.S. MONTE PASCOAL.** Hamburg-Süd Amerika Line.  
Length, 500 ft. 3 in. ; Gross Tonnage, 13,882 and 13,870 ;  
Funnels : White, Red Tops.



**M.S. GENERAL OSORIO.** Hamburg-Amerika Line. Length, 498 ft. 5 ins.;  
Gross Tonnage, 11,590;  
Funnels: Yellow, with Black, White, and Red Band at Tops.



**ALBERTVILLE.** Lloyd Royal Belge. Length, 494 ft.;  
Gross Tonnage, 10,769;  
Funnels: Yellow.



**M.S. LLANGIBBY CASTLE.** Union Castle Line. Length, 486 ft.; Gross Tonnage, 11,951;  
Funnels: Red, Black Tops.



**M.S. CABO SAN AGUSTIN.** Ybarra & Co. Length, 482 ft. 5 ins.;  
Gross Tonnage, 11,868;  
Funnels: Black.



**PATRIA.** Rotterdam Lloyd (Wm. Ruys & Zonen). Length, 480 ft.; Gross Tonnage, 9,891;  
Funnels: Black.



**SPHINX.** Messageries Maritimes. Length, 478 ft.; Gross Tonnage, 11,375;  
Funnels: Black.



**LEOPOLDVILLE.** Lloyd Royal Belge. Length, 478 ft. 8 ins.;  
Gross Tonnage, 11,256;  
Funnels: Yellow.



**GANGE.** Lloyd Triestino. Length, 477 ft. 5 ins.; Gross Tonnage, 12,272;  
Funnels: Black.



**CUBA.** Cie. Générale Transatlantique. Length, 476 ft.; Gross Tonnage, 11,357;  
Funnels: Red, Black Tops.



**FLORIDA.** Société Générale de Transports Maritimes à Vapeur.  
Length, 471 ft. 2½ ins.; Gross Tonnage, 9,149;  
Funnels: Black, Red Band.



**M.S. DUNBAR CASTLE.** Union Castle Line. Length, 471 ft. 2 ins.;  
Gross Tonnage, 10,002;  
Funnels: Red, Black Tops.



**M.S. EUROPA.** East Asiatic Co. Length, 465 ft. 4 ins.; Gross Tonnage, 10,224;  
Funnels: Yellow.



**M.S. AMERIKA.** East Asiatic Co. Length, 465 ft. 4 ins. ; Gross Tonnage, 10,110  
Funnels : Yellow.



**M.S. JEAN LABORDE.** Messageries Maritimes. Length, 463 ft. 6 ins. ;  
Gross Tonnage, 11,414 ;  
Funnels : Black.



**M.S. WENATCHEE STAR. M.S. YAKIMA STAR.** Blue Star Line.  
Length, 460 ft. 4 ins. ; Gross Tonnage, 6,607 ;  
Funnels : Red, Black Top and White Band, Blue Star on White Disc.



**M.S. ACHIMOTA.** Elder Dempster. Length, 460 ft. ; Gross Tonnage, 10,000 ;  
Funnels : Buff.



**MARTHA WASHINGTON.** Cosulich Line. Length, 459 ft. ; Gross Tonnage, 8,347 ;  
Funnels : Red, White Band, Black Tops.



**M.S. MAGDALENA. M.S. ORINOCO.** Hamburg-America. Length, 456 ft. 8 ins. ;  
Gross Tonnage, 9,540 ;  
Funnels : Yellow, with Black, White, and Red Band at Tops.



**TILAWA. TALMA.** British India S.N. Co. Length, 451 ft. ;  
Gross Tonnage, 10,006 and 10,000 ;  
Funnels : Black, Two White Bands, Black Tops.



**FLANDRIA. ORANIA.** Holland Lloyd. Length, 450 ft. ; Gross Tonnage, 10,171 and 9,763 ;  
Funnels : Yellow, Black Band.



**M.S. ERIDAN.** Messageries Maritimes. Length, 445 ft. 4 ins. ; Gross Tonnage, 9,928 ;  
Funnels : Black.



**DE LA SALLE.** Cie. Générale Transatlantique. Length, 440 ft. ; Gross Tonnage, 8,400 ;  
Funnels : Red, Black Tops.  
**SINAIA.** Cyp. Fabra. Length, 440 ft. ; Gross Tonnage, 8,666.



**ASIE.** Chargeurs Réunis. Length, 439 ft. 3 ins. ; Gross Tonnage, 8,561 ;  
Funnels : Yellow, Red Stars on White Band.



**PEROU.** Cie. Générale Transatlantique. Length, 432 ft. 5 ins. ; Gross Tonnage, 6,599 ;  
Funnels : Red, Black Tops.



**M.S. THÉOPHILE GAUTIER.** Messageries Maritimes. Length, 425 ft.;  
Gross Tonnage, 9,000;  
Funnels: Black.



**SIMON BOLIVAR.** Royal Nederlands Line. Length, 420 ft.; Gross Tonnage, 7,906;  
Funnels: Black, Two White Bands.



**M.S. RIO BRAVO. M.S. RIO PANUCO.** Flensburger Dampfer Co. (H. Schultdt).  
Length, 410 ft.; Gross Tonnage, 5,045;  
Funnels; Black, Blue Band, White Diamond with Red S.



**RANGATIRA.** Union Steamship Company of N.Z. Length, 406 ft. 1 in.;  
Gross Tonnage, 6,152;  
Funnels: Red, Black Tops.



**NAGASAKI MARU. SHANGHAI MARU.** Nippon Yusen Kaisha. Length, 402 ft.;  
Gross Tonnage, 5,272;  
Funnels: Black, White Band.



**M.S. VENUS.** Bergen Steamship Co. Length, 398 ft. 5 ins.;  
Gross Tonnage, 5,407;  
Funnels: Black, Three White Rings.





**KEIFUKU MARU.** Imperial Japanese Railway. Length, 385 ft.; Gross Tonnage, 5,831;  
Funnels: Yellow, Black Top, Red  $\Sigma$  on Yellow.



**ANGLIA. CAMBRIA. HIBERNIA. SCOTIA.** L.M.S. Railway.  
Length, 380 ft. 5 ins.; Gross Tonnage, 3,460;  
Funnels: Yellow, Black Tops.



**VIENNA. AMSTERDAM. PRAGUE.** London and North Eastern Railway.  
Length, 350 ft.; Gross Tonnage, 4,218;  
Funnels: Yellow, Black Tops.



**DUKE OF ARGYLL. DUKE OF LANCASTER. DUKE OF ROTHESAY.** London, Midland  
and Scottish Railway. Length, 349 ft.; Gross Tonnage, 3,608;  
Funnels: Yellow, Black Tops.



**M.S. ULSTER MONARCH. ULSTER QUEEN. ULSTER PRINCE.** Ulster Imperial Line.  
Length, 346 ft.; Gross Tonnage, 3,759;  
Funnels: Red, Black Top.



**ANTWERP. MALINES. BRUGES.** London and North Eastern Railway.  
Length, 321 ft. 6 ins.; Gross Tonnage, 2,957;  
Funnels: Yellow, Black Tops.



**HANTONIA. NORMANNIA.** Southern Railway. Length, 290 ft. 3 ins.;  
Gross Tonnage, 1,567;  
Funnels: Buff.



**DIEPPE.** Southern Railway. Length, 273 ft. 5 ins.; Gross Tonnage, 1,228;  
Funnels: White, Black Tops.



**CERAMIC.** White Star Line. Length, 655 ft. 1 in. ; Gross Tonnage, 18,495 ;  
Funnel : Buff, Black Top.



**CHAMPLAIN.** Cie. Générale Transatlantique. Length, 607 ft. ; Gross Tonnage, 28,912 ;  
Funnel : Red, Black Top.



**CARINTHIA. FRANCONIA.** Cunard. Length, 600 ft. 7 ins. and 601 ft. 3 ins. ;  
Gross Tonnage, 20,277 and 20,175 ;  
Funnel : Red, Black Top.



**SCYTHIA. LACONIA. SAMARIA.** Cunard. Length, 601 ft. ;  
Gross Tonnage, 19,761, 19,695, and 19,597 ;  
Funnel : Red, Black Top.



**MINNETONKA. MINNEWASKA.** Atlantic Transport. Length, 600 ft. 8 ins.  
Gross Tonnage, 21,998 and 21,716 ;  
Funnel : Red, Black Top.



**M.S. VULCANIA. M.S. SATURNIA. Cosulich Line.** Length, 599 ft. and 606 ft. 2 ins. ;  
Gross Tonnage, 23,970 and 23,940 ;  
Funnel : Red, White Band and Black Top.



**M.S. LAFAYETTE. Cie. Générale Transatlantique.** Length, 577 ft. 2 ins. ;  
Gross Tonnage, 25,178 ;  
Funnel : Red, Black Top.



**ALMANZORA. ATLANTIS. ARLANZA. Royal Mail.**  
Length, 570 ft. ; Gross tonnage, 15,551 to 14,622 ;  
Funnel : Buff.



**ULYSSES NESTOR. Blue Funnel Line.** Length, 563 ft. 2 ins. ;  
Gross Tonnage, 14,652 and 14,629 ;  
Funnel : Blue, Black Top.



**M.S. NEPTUNIA. M.S. OCEANIA. Cosulich Line.** Length, 556 ft. ; Gross Tonnage, 19,475 ;  
Funnel : Red, White Band and Black Top.



**TUSCANIA. CALIFORNIA. Anchor.** Length, 553 ft. ; Gross Tonnage, 16,901 and 16,792 ;  
Funnel : Black.



**LANCASTRIA.** Cunard. Length, 552 ft. 8 ins. Gross Tonnage, 16,243; Funnel; Red, Black Top.

**CAMERONIA.** Anchor. Length, 552 ft. 4 ins.; Gross Tonnage, 16,297; Funnel: Black.



**MONGOLIA. MOLDAVIA.** Peninsular and Oriental. Length, 551 ft. 6 ins. and 552 ft. 4 ins.; Gross Tonnage, 16,596 and 16,556; Funnel: Black.



**M.S. CHRISTIAAN HUYGENS.** Stoomvaart Maatschappij Nederland. Length, 551 ft. 5 ins.; Gross Tonnage, 15,704; Funnels: Buff, Black Top.



**AKAROA.** Shaw, Savill and Albion. Length, 550 ft. 7 ins.; Gross Tonnage, 14,947; Funnel: Buff, Black Top.



**MEGANTIC.** White Star. Length, 550 ft. 4 ins.; Gross Tonnage, 14,878; Funnel: Buff, Black Top.



**ORDUNA.** Pacific Steam Navigation Co. Length, 550 ft. 3 ins.; Gross Tonnage, 15,507; Funnel: Buff.



**ORBITA.** Pacific Steam Navigation Co. Length, 550 ft. 3 ins. ; Gross Tonnage, 15,495 ;  
Funnel ; Buff.



**CALGARIC.** White Star. Length, 550 ft. 3 ins. ; Gross Tonnage, 16,083 ;  
Funnel : Buff, Black Top.



**M.S. BALOERAN.** Rotterdam Lloyd. Length, 550 ft. ; Gross Tonnage, 16,981 ;  
Funnel : Black.



**M.S. DEMPO.** Rotterdam Lloyd. Length, 550 ft. ; Gross Tonnage, 16,979 ;  
Funnel : Black.



**BETHORE.** Ore Steamship Co., N.Y. Length, 550 ft. ; Gross Tonnage, 8,257 ;  
Funnel : Grey, Blue and White Bands, White O.



**M.S. SIR JAMES CLARK ROSS.** Hvalfanger A/S Rosshavet.  
Length, 537 ft. 9 ins. ; Gross Tonnage, 14,362.



**HOBSONS BAY. LARGS BAY. ESPERANCE BAY. JERVIS BAY. MORETON BAY.**  
Aberdeen Commonwealth Line. Length, 530 ft.; Gross Tonnage, 14,198 to 14,145;  
Funnel: Yellow.



**OROPESA.** Pacific Steam Navigation Co. Length, 530 ft.; Gross Tonnage, 14,075;  
Funnel: Buff.



**SAN MELITO.** Eagle Oil Transport Co. Length, 530 ft.; Gross Tonnage, 12,296;  
Funnel: Black, Yellow Band, Black Eagle, Black O on White Band, Yellow Band.



**CADILLAC. SARANAC.** Anglo American Oil Co. Length, 530 ft. 2 ins.;  
Gross Tonnage, 12,076 and 12,074;  
Funnel: Red, Black Top.



**M.S. ATHELROWN.** United Molasses Co. Length, 526 ft. 5 ins.; Gross Tonnage, 11,999;  
Funnel: Red, B.M.Co. on White Diamond, Black Top.



**CLAN URQUHART.** Clan Line. Length, 526 ft. 2 ins.;  
Gross Tonnage, 10,236;  
Funnel: Black, Two Red Bands.



**LETITIA. ATHENIA.** Anchor-Donaldson. Length, 525 ft. 7 ins. and 526 ft. 3 ins.;  
Gross Tonnage, 13,475 and 13,465;  
Funnel: Black, White Band, Black Top.



**OROYA.** Pacific Steam Navigation Co. Length, 525 ft. 3 ins. ; Gross Tonnage, 12,257 ;  
Funnel : Buff.



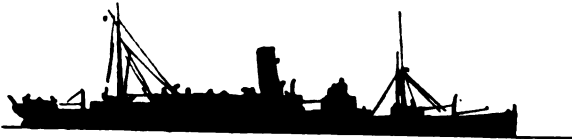
**CALGAROLITE.** Imperial Oil Co. Length, 522 ft. ; Gross Tonnage, 11,941 ;  
Funnel : Black, Blue Band between Two White, Black Top.



**M.S. F. H. BEDFORD, JUNR.** Baltisch Amer. Petrol. Import.  
Length, 521 ft. 4 ins. ; Gross Tonnage, 11,952.



**ALAUNIA. ASCANIA. AURANIA.** Cunard Line. Length, 520 ft. ;  
Gross Tonnage, 14,030 to 13,984 ;  
Funnel ; Red, Black Top.



**ANDANIA. AUSONIA. ANTONIA.** Cunard Line. Length, 520 ft. ;  
Gross Tonnage, 13,950 to 13,867 ;  
Funnel : Red, Black Top.



**BARADINE. BARRABOOL. BALLARAT. BALRANALD. BENDIGO.** Peninsular and  
Oriental. Length, 519 ft. 9 ins. ; Gross Tonnage, 13,072 to 12,972 ;  
Funnel : Black.





**MANGALORE. MATHURA. Brocklebank.** Length, 518 ft.; Gross Tonnage, 9,571 and 9,743;  
Funnel: Black, Blue and White Band, Black Top.



**MALANCHA. Brocklebank.** Length, 518 ft.; Gross Tonnage, 9,917;  
Funnel: Black, Blue and White Band, Black Top.



**MACHARDA. Brocklebank.** Length, 518 ft.; Gross Tonnage, 9,785;  
Funnel: Black, Blue and White Band, Black Top.



**DROTNINGHOLM. Swedish American Line.** Length, 517 ft.; Gross Tonnage, 11,055;  
Funnel: Yellow, Blue Disc.



**M.S. HARRY G. SEIDEL. Baltisch Amer. Petrol. Import.**  
Length, 513 ft. 2 ins.; Gross Tonnage, 11,395.



**PRESIDENT ROOSEVELT. PRESIDENT HARDING. United States Lines.**  
Length, 516 ft. 5 ins.; Gross Tonnage, 13,869;  
Funnel: Red, White Band, Blue Top.



**KRALJICA MARIJA.** Jugoslavenski Lloyd. Length, 515 ft. 2 ins. ;  
Gross Tonnage, 10,196.



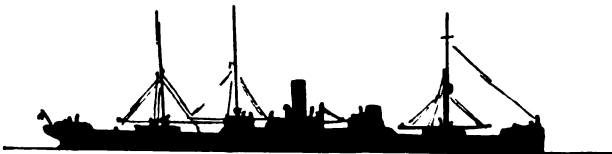
**FUSHIMI MARU. SUWA MARU.** Nippon Yusen Kaisha. Length, 513½ ft. and 516 ft. ;  
Gross Tonnage, 10,936 and 10,672 ;  
Funnel : Black.



**M.S. HIKAWA MARU. M.S. HIYE MARU. M.S. HEIAN MARU.** Nippon Yusen  
Kaisha. Length, 510 ft. to 512 ft. 6 ins. ; Gross Tonnage, 11,622 to 11,616 ;  
Funnels : Black.



**ORCOMA.** Pacific Steam Navigation Co. Length, 511 ft. 6 ins. Gross Tonnage, 11,580 ;  
Funnel : Buff.



**HORORATA.** New Zealand Shipping Co. Length, 511 ft. 1 in. ;  
Gross Tonnage, 11,245 ;  
Funnel : Buff.



**PHILOCTETES. ACHILLES. TYNDAREUS.** Blue Funnel Line.  
Length, 511 ft. 9 ins., 507 ft. 4 ins., and 507 ft. ; Gross Tonnage, 11,431 to 11,347  
Funnel : Blue, Black Top.



**VOLTAIRE. VANDYCK.** Lamport and Holt. Length, 510 ft. 6 ins.;  
Gross Tonnage, 13,248 and 13,233;  
Funnel: Blue, White Band, Black Top.



**M.S. VICTOLITE. M.S. VANCOLITE.** Imperial Oil Co. Length, 510 ft. 2 ins.;  
Gross Tonnage, 11,410 and 11,404;  
Funnel: Black, Blue Band between Two White, Black Top.



**TAFELBERG.** Kerguelen Sealing and Whaling Co. Length, 508 ft. 3 ins.;  
Gross Tonnage, 13,640.



**M.S. TERUKUNI MARU. M.S. YASUKUNI MARU.** Nippon Yusen Kaisha.  
Length, 507 ft. and 505 ft.; Gross Tonnage, 11,930.  
Funnel: Black, Broad White Band, Two Red on White.



**BEAVERFORD. BEAVERHILL. BEAVERBURN. BEAVERBRAE. BEAVERDALE.**  
Canadian Pacific. Length, 503 ft.; Gross Tonnage, 10,042 to 9,956;  
Funnel: Yellow.



<b>PRESIDENT HAYES.</b>	Dollar Steamship Lines.	Length, 502 ft.;	Gross Tonnage, 10,533;
<b>PRESIDENT MONROE.</b>	"	"	10,553;
<b>PRESIDENT VANBUREN.</b>	"	"	10,533;
<b>PRESIDENT ADAMS.</b>	"	"	10,516;
<b>PRESIDENT HARRISON.</b>	"	"	10,504;
<b>PRESIDENT POLK.</b>	"	"	10,500;
<b>PRESIDENT GARFIELD.</b>	"	"	10,495;

Funnel: Black, White \$ on Red Band.



**PORT MELBOURNE. PORT NAPIER. PORT SYDNEY.** Commonwealth and Dominion Line. Length, 501 ft. 3 ins. ; Gross Tonnage, 9,152 ; Funnel : Red, Black Top.



**DARRO. DEMERARA. DESEADO. DESNA.** Royal Mail. Length, 500 ft. 7 ins. ; Gross Tonnage, 11,493 to 11,406 ; Funnel : Buff.



**THEMISTOCLES.** Aberdeen-White Star Line. Length, 500 ft. 6 ins. ; Gross Tonnage, 11,231 ; Funnel : Buff.



**LLANSTEPHAN CASTLE.** Union Castle Line. Length, 500 ft. 5 ins. ; Gross Tonnage, 11,299. Funnel : Red, Black Top.



**TAMAROA. MATAROA.** Shaw, Savill and Albion. Length, 500 ft. 4 ins. ; Gross Tonnage, 12,354 and 12,333 ; Funnel : Buff, Black Top.



**FORDSDALE.** Aberdeen Commonwealth Line. Length, 500 ft. ; Gross Tonnage, 9,947 ; Funnel : Yellow.



**GLENIFFER.** Glen Line. Length, 500 ft. ; Gross Tonnage, 9,429 ;  
Funnel : Red, Black Top.

**CARNARVONSHIRE.** Royal Mail. Length, 500 ft. 3 ins. ;  
Gross Tonnage, 9,406 ;  
Funnel : Buff.



**CRISTOBAL COLON. HABANA.** Compañía Trasatlántica.  
Length, 499 ft. 4 ins. and 480 ft. ; Gross Tonnage, 10,833 and 10,551 ;  
Funnel : Black.



**MAGDAPUR. MANIPUR.** Brocklebank Line. Length, 499 ft. 6 ins. ;  
Gross Tonnage, 9,237 ;  
Funnel : Black, Blue and White Band, Black Top.



**SIERRA NEVADA.** Hamburg-South Amerika. Length, 499 ft. 5 ins. ;  
Gross Tonnage, 13,589 ;  
Funnel : White, Red Top.



**SARPEDON. HECTOR. ANTENOR.** Blue Funnel Line.  
Length, 490 ft., 498 ft. 8 ins., 497 ft. 7 ins. ; Gross Tonnage, 11,321 to 11,174 ;  
Funnel : Blue, Black Top.



**EASTERN PRINCE. WESTERN PRINCE. NORTHERN PRINCE. SOUTHERN PRINCE.**  
Prince Line. Length, 496 ft. 2 ins. ; Gross Tonnage, 10,926 to 10,917 ;  
Funnel : Black, Two Red Bands, Feathers on side.



**HARUNA MARU. HAKONE MARU. HAKOZAKI MARU. HAKUSAN MARU.**  
Nippon Yusen Kaisha. Length, 495 ft.; Gross Tonnage, 10,421 to 10,380;  
Funnel: Black.



**M.S. CARIBIA.** Hamburg-Amerika. Length, 494 ft. Gross Tonnage, 12,000;  
Funnel: Yellow, with Black, White and Red Bands at Top.



**AENEAS. ASCANIUS. ANCHISES.** Blue Funnel Line. Length, 493 ft.;  
Gross Tonnage, 10,058 to 10,000;  
Funnel: Blue, Black Top.



**DIOMED. CALCHAS. PERSEUS. MENELAUS.** Blue Funnel Line.  
Length, 491 ft., 490 ft. 8 ins., 490 ft. 5 ins. and 495 ft. 5 ins.;  
Gross Tonnage, 10,374 to 10,283;  
Funnel: Blue, Black Top.



**M.S. DELFTDIJK. M.S. DAMSTERDIJK.** Holland-Amerika. Length, 490 ft. 9 ins.;  
Gross Tonnage, 10,220 and 10,155;  
Funnel: Buff, White Band between Two Green.



**M.S. POELAU BRAS. POELAU LAUT. POELAU ROEBIAH. POELAU TELLO.**  
Stoomvaart Maatschappij Nederland. Length, 490 ft.; Gross Tonnage, 9,250;  
Funnel: Buff, Black Top.



**CITY OF EXETER.** Ellerman City Line. Length, 486 ft. 7 ins.; Gross Tonnage, 9,447;  
Funnel: Buff, White Band, Black Top.



**SULTAN STAR. M.S. TUSCAN STAR.** Blue Star Line. Length, 486 ft. 1 in. and 471 ft.;  
Gross Tonnage, 12,326 and 11,449;  
Funnel: Red, Black Top and White Band on Black, Blue Star on White Disc.



**REMUERA.** New Zealand Shipping Co. Length, 485 ft.; Gross Tonnage, 11,383;  
Funnel: Yellow.



**M.S. GLENAPP. M.S. GLENBEG. M.S. GLENGARRY. M.S. GLENOGLE.** Glen Line.  
Length, 485 ft.; Gross Tonnage, 9,460;  
Funnel: Red, Black Top.

**M.S. DINTELDIJK. M.S. DRECHTDIJK.** Holland-Amerika. Length, 485 ft.;  
Gross Tonnage, 9,399;  
Funnel: Buff, Two Green Bands, White between Buff Top.

**M.S. LOCHKATRINE. M.S. LOCHGOIL. M.S. LOCHMONAR.** Royal Mail.  
Length, 485 ft.; Gross Tonnage, 9,409;  
Funnel: Buff.



**CITY OF PARIS.** Ellerman City Line. Length 484 ft. 7 ins.; Gross Tonnage, 10,902;  
Funnel: Buff, White Band, Black Top.



**KERGUELEN.** Chargeurs Réunis. Length, 484 ft. 2 ins.; Gross Tonnage 10,123;  
Funnel: Yellow, Red Stars on White Band.





**MAUI.** Matson Navigation Co. Length 484 ft. ; Gross Tonnage, 9,801 ;  
Funnel : Yellow, Black Top, with " M."



**M.S. STAFFORDSHIRE. SHROPSHIRE. CHESHIRE.** Bibby Line.  
Length, 483 ft. 6 ins. ; Gross Tonnage, 10,654 to 10,560 ;  
Funnel : Salmon Pink, Black Top.



**M.S. WORCESTERSHIRE.** Bibby Line. Length, 483 ft. ; Gross Tonnage, 11,453 ;  
Funnel : Salmon Pink, Black Top.



**CEYLAN.** Chargeurs Réunis. Length, 482 ft. 3 ins. ; Gross Tonnage, 8,430 ;  
Funnel ; Yellow, Red Stars on White Band.



<b>FORMOSE</b> }	Chargeurs Réunis.	Length, 483 ft. 4 ins. ;	Gross Tonnage, 9,975 ;
<b>GROIX.</b>	" "	" "	" "
<b>BELLE ISLE.</b>	" "	479 ft. ;	" " 9,591 ;
<b>AURIGNY.</b>	" "	481 ft. 6 ins. ;	" " 9,589 ;
<b>DESIRADE</b> }	" "	" "	" "
<b>EUBEE.</b> }	" "	483 ft. 4 ins. ;	" " 9,645 ;

Funnel : Yellow, Red Stars on White Band.

**COMPIÈGNE. CHANTILLY.** Messageries Maritimes. Length 478 ft. 5 ins. ;  
Gross Tonnage 9,986 ;  
Funnel : Black.



**M.S. ZEALANDIC. M.S. COPTIC.** Shaw, Savill and Albion. Length, 482 ft. 6 ins. ;  
Gross Tonnage, 8,281 ;  
Funnel : Buff, Black Top.



**M.S. CABO SAN ANTONIO. M.S. SANTO THOME. Ybarra & Co.**  
Length, 482 ft. 5 ins. ; Gross Tonnage, 12,275 and 11,868 ;  
Funnel : Black.



**YORKSHIRE. LANCASHIRE. Bibby Line.** Length, 482 ft. 4 ins. ; Gross Tonnage, 10,184  
and 9,445 ;  
Funnel : Salmon Pink, Black Top.



**DIPLOMAT. Harrison Line.** Length, 482 ft. ; Gross Tonnage, 8,218 ;  
Funnel : Black, Red Band between Two White.



**URUGUAY. Compañía Trasatlantica.** Length, 481 ft. 9 ins. ; Gross Tonnage, 10,348 ;  
Funnel : Black.



**PORT ADELAIDE. PORT AUCKLAND. PORT BOWEN. PORT BRISBANE. PORT CAMPBELL. PORT CAROLINE. PORT HARDY. PORT HUNTER. PORT NICHOLSON. Commonwealth and Dominion Line.** Length, 481 ft. 2 ins. ;  
Gross Tonnage, 8,267 to 8,653 ;  
Funnel : Red, Black Top.



**ARGENTINA. Compania Trasatlantica.** Length, 480 ft. ; Gross Tonnage, 10,137 ;  
Funnel : Black.



**RUAHINE.** New Zealand Shipping Co. Length, 480 ft. 6 ins. ; Gross Tonnage, 10,870 ;  
Funnel : Yellow.



**NEURALIA. NEVASA.** British India S.N. Co. Length, 480 ft. 5 ins. ; Gross Tonnage, 9,182 ;  
Funnel : Black, Two White Bands.



**M.S. INDRAPOERA.** Rotterdam Lloyd. Length, 479 ft. 5 ins. ; Gross Tonnage, 10,746 ;  
Funnel : Black.



**CITY OF SIMLA.** Ellerman City Line. Length, 476 ft. 7 ins. ; Gross Tonnage, 9,468 ;  
Funnel : Buff, White Band, Black Top.



**IROQUOIS.** Anglo-American Oil Co. Length, 476 ft. 3 ins. ; Gross Tonnage, 9,202 ;  
Funnel ; Red, Black Top.



**STUART STAR. AFRIC STAR. NAPIER STAR. RODNEY STAR.** Blue Star Line.  
Length, 475 ft. 8 ins. to 476 ft. 9 ins. ; Gross Tonnage, 11,884 to 10,583 ;  
Funnel : Red, Black Top and White Band, Blue Star on White Disc.



**M.S. PORT ALMA. M.S. PORT FAIRY. M.S. PORT HUON. M.S. PORT FREMANTLE.**  
**M.S. PORT GISBORNE. Commonwealth and Dominion.** Length, 477 ft. 3 ins.;  
 Gross Tonnage, about 8,000;  
 Funnel: Red, Black Top.



**DUNLUCE CASTLE. DURHAM CASTLE. Union Castle.**  
 Length, 475 ft. 5 ins.; Gross Tonnage, 8,130;  
 Funnel: Red, Black Top.



**ARIZONA MARU. HAWAII MARU. MANILA MARU. AFRICA MARU.**  
 Osaka Shosen Kaisha. Length, 475 ft.; Gross Tonnage, 9,618 to 9,414;  
 Funnel: Black, Two White Bands, joined at Side.



**DOMINIA. Telegraph Construction and Maintenance Co.** Length, 475 ft.;  
 Gross Tonnage, 9,250;  
 Funnel: Yellow.



**OXFORDSHIRE. Bibby Line.** Length, 474 ft. 7 ins.; Gross Tonnage, 8,624;  
 Funnel: Salmon Pink, Black Top.



**LLANDAFF CASTLE. LLANDOVERY CASTLE. Union Castle Line.**  
 Length, 471 ft. 1 in.; Gross Tonnage, 10,786, and 10,609;  
 Funnel: Red, Black Top.



**HERMINIUS.** Shaw, Savill, and Albion. Length, 477 ft. ; Gross Tonnage, 8,000 ;  
Funnel : Buff, Black Top.



**M.S. OPAWA. M.S. ORARI. M.S. OTAIO.** New Zealand Shipping Co.  
Length, 471 ft., 471 ft. and 472 ft. 2 ins. ; Gross Tonnage, 10,107, 10,107 and 10,048 ;  
Funnel : Yellow.



**MAIDAN. MAHOUT. MAHSEER. MAHRONDA. MAIHAR. MALAKAND.**  
**MATHERAN. MANAAR.** Brocklebank. Length, 470 ft. 4 ins. ;  
Gross Tonnage, 8,077 ;  
Funnel : Black, Blue and White Band, Black Top.



**MALAKUTA. MAHANADA.** Brocklebank. Length, 470 ft. 2 ins. ; Gross Tonnage, 7,205 ;  
Funnel : Black, Blue and White Band, Black Top.



**CALAMARES. PASTORES.** United Fruit Co. Length, 470 ft. 4 ins. ;  
Gross Tonnage, 7,233 and 7,242 ;  
Funnel : Buff, White Diamond on Red Band, Black Top.



**CITY OF NAGPUR.** Ellerman City Line. Length, 469 ft. 9 ins. ; Gross Tonnage, 10,138 ;  
Funnel : Buff, White Band, Black Top.



**GLOUCESTERSHIRE.** Bibby Line. Length, 467 ft. 2 ins. ; Gross Tonnage, 8,124 ;  
Funnel : Salmon Pink, Black Top.



**AMARAPOORA.** Henderson Line. Length, 465 ft. 8 ins. ; Gross Tonnage, 8,012;  
Funnel : Black..



**MADURA. MALDA. MANTOLA. MATIANA. MODASA.** British India S.N. Co.  
Length, 465 ft. 2 ins. ; Gross Tonnage, about 9,000 ;  
Funnels : Black, Two White Bands.



**TAJANDOEN.** Stoomvaart Maatschappij Nederland. Length, 465 ft. ;  
Gross Tonnage, 8,800 ;  
Funnel : Buff. Black Top.



**M.S. PORT DUNEDIN. M.S. PORT HOBART.** Commonwealth and Dominion Line.  
Length, 465 ft. ; Gross Tonnage, 7,500 ;  
Funnel : Red, Black Top.



**M.S. THURLAND CASTLE. M.S. PENRITH CASTLE.** Lancashire Shipping Co.  
Length, 464 ft. 6 ins. ; Gross Tonnage, 6,372 and 6,369 ;  
Funnel : Red, Black Top.



**M.S. BUENOS AIRES MARU. M.S. RIO DE JANEIRO MARU.** Osaka Shoden Kaisha  
Length, 461 ft. 3 ins. ; Gross Tonnage, 9,626 ;  
Funnel : Black, Two White Bands joined at Side.



**TEKOA. TONGARIRO. TURAKINA.** New Zealand Shipping Co. Length, 460 ft. 5 ins. ;  
Gross Tonnage, 8,565 to 8,531 ;  
Funnel : Yellow.

**KENT. MIDDLESEX. SURREY.** Federal Steam Nav. Co.  
Funnel : Red, Black Top. St. George's Flag with Blue Square in centre, on Red.



**M.S. HEIYO MARU.** Nippon Yusen Kaisha. Length, 460 ft. ;  
Gross Tonnage, 9,816 ;  
Funnel : Black, Broad White Band, Two Red on White.



**TAINUI.** Shaw, Savill, and Albion. Length, 477 ft. 8 ins. ; Gross Tonnage, 9,965 ;  
Funnel : Buff, Black Top.



**M.S. GULFCREST.** Gulf Refining Co. of New York. Length, 460 ft. ;  
Gross Tonnage, 8,950.



**RAJULA. ROHNA.** British India S.N. Co. Length, 460 ft. ;  
Gross Tonnage, 8,478 and 8,602 ;  
Funnel : Black, Two White Bands.



**CITY OF LYONS.** Ellerman Line. Length, 455 ft. ; Gross Tonnage, 7,063  
Funnel : Buff, White Band, Black Top.





**AGAPENOR. AUTOLYCUS. AUTOMEDON. DARDANUS. ELPENOR. EUMAEUS.  
GLAUCUS. HELENUS. LYCAON. MACHAON. MENTOR. MERIONES. PHEMIUS.  
PYRRHUS. RHEXENOR. TEIRESIAS. TROILUS. Blue Funnel Line.**  
Length, 455 ft. 2 ins. ; Gross Tonnage, 7,552 to 7,957 ;  
Funnel : Blue, Black Top.



**COSTA RICA. Nederland Stoomvaart Maatschappij.**  
Length, 455 ft. ; Gross Tonnage, 8,300 ;  
Funnel ; Buff, Black Top.



**COLLEGIAN. Harrison Line. Length, 455 ft. ; Gross Tonnage, 5,850 ;**  
Funnel : Black, Red Band between Two White.



**CLAN MACTAGGART. CLAN MACTAVISH. Clan Line. Length, 452 ft. 7 ins.,  
and 469 ft. ; Gross Tonnage, 7,602 and 7,619 ;**  
Funnel : Black, Two Red Bands.



**GARTH CASTLE. GRANTULLY CASTLE. GLOUCESTER CASTLE. GUILDFORD CASTLE.  
Union Castle. Length, 452 ft. 6 ins. ; Gross Tonnage, 7,715 ;**  
Funnel : Red, Black Top.



**HEREFORDSHIRE. Bibby Line. Length, 452 ft. 3 ins. ; Gross Tonnage, 7,126 ;**  
Funnel : Salmon Pink, Black Top.



**MANUEL ARNUS. Compañía Trasatlántica. Length, 435 ft. ; Gross Tonnage, 7,578 ;**  
Funnel : Black.



**M.S. SILVERPALM. M.S. SILVERWILLOW. M.S. SILVERYEW. Silver Line,**  
Length, 450 ft. 9 ins. ; Gross Tonnage, 6,373.



**M.S. ACCRA. M.S. APAPA. Elder Dempster.** Length, 450 ft. 7 ins. ;  
Gross Tonnage, 9,337 and 9,333 ;  
Funnel : Buff.



**M.S. ABA. M.S. ADDA. Elder Dempster.** Length, 450 ft. 5 ins. and 435 ft. 3 ins. ;  
Gross Tonnage, 7,937 and 7,816 ;  
Funnel : Buff.



**M.S. SOMERSETSHIRE. M.S. DORSETSHIRE. Bibby Line.** Length, 450 ft. 3 ins. ;  
Gross Tonnage, 9,648 and 9,345 ;  
Funnel : Pink, Black Top.



**EXCALIBUR. EXETER. EXCAMBION. EXOCHORDA. American Export Lines.**  
Length, 450 ft. ; Gross Tonnage, 9,360.



**M.S. DOMALA. British India S.N. Co.** Length, 450 ft. ; Gross Tonnage, 8,441 ;  
Funnel : Black, Two White Bands.



**CITY OF NEW YORK. American-South African Line.**  
Length, 450 ft. ; Gross Tonnage, 8,272.



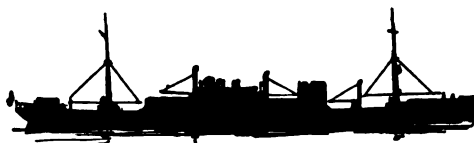
**BRITANNIA.** Anchor. Length, 450 ft.; Gross Tonnage, 8,464;  
Funnel: Black.



**LONDON MARU. PARIS MARU. Osaka Shosen Kaisha.** Length 450 ft. 1 in.;  
Gross Tonnage, 7,191;  
Funnel: Black, Two White Bands joined at Sides.



**MAKURA.** Union Steam Ship Co. of N.Z. Length, 450 ft.; Gross Tonnage, 8,075;  
Funnel: Red, Black Top.



**M.S. ESQUILINO. M.S. VIMINALE.** Lloyd Triestino. Length, 450 ft. and 467 ft. 5 ins.;  
Gross Tonnage, 8,657.



**MANCHESTER REGIMENT. LONDON IMPORTER. LONDON MERCHANT.**  
Furness Lines. Length, 450 ft.; Gross Tonnage, 7,930;  
Funnel: Red, Black Top, Black Base and Black Band.



**M.S. DURENDA.** British India S.N. Co. Length, 450 ft.; Gross Tonnage, 7,241;  
Funnel: Black, Two Narrow White Bands.



**NOVARA.** Peninsular and Oriental. Length, 449 ft. 7 ins. ; Gross Tonnage, 6,375 ; Funnel : Black.

**NELLORE. NANKIN.** Eastern and Australian Line. Length, 450 ft. ; Gross Tonnage, about 7,000 ; Funnel : Black.



**M.S. KOTA PINANG. M.S. KOTA TJANDI. M.S. KOTA NOPAN. M.S. KOTA AGOENG.** Rotterdam Lloyd. Length, 449 ft. ; Gross Tonnage, 7,275 to 7,331 ; Funnel : Black.



**MASIRAH.** Anchor-Brocklebank Line. Length, 448 ft. ; Gross Tonnage, 6,836 ; Funnel : Black, Blue and White Band, Black Top.



**ANCHORIA.** Anchor-Brocklebank Line. Length, 446 ft. 4 ins. ; Gross Tonnage, 6,112 ; Funnel : Black, Blue and White Band, Black Top.



**M.S. KINAI MARU. M.S. TOKAI MARU. M.S. SANYO MARU. M.S. HOKUROKU MARU.** Osaka Shosen Kaisha. Length, 446 ft. ; Gross Tonnage, 8,365 ; Funnel : Black, Two White Bands joined at Side.



**MAHRATTA. MAKALLA.** Anchor-Brocklebank Line. Length, 445 ft. ; Gross Tonnage, 6,690 ; Funnel : Black, White Band, Blue and White Stripe Band, Black Top.



**CINGALESE PRINCE.** Rio Cape Line. Length, 441 ft. 8 ins. ; Gross Tonnage, 6,750 ; Funnel : Black, Two Red Bands, Feathers on Side.



**M.S. CHINESE PRINCE. M.S. JAPANESE PRINCE. M.S. JAVANESE PRINCE.  
M.S. MALAYAN PRINCE. Rio Cape Line.** Length, 441 ft.; Gross Tonnage, 6,734;  
Funnel: Black, Two Red Bands, Feathers on Side.



**BRITISH MERCHANT. British Tanker Co.** Length, 440 ft. 7 ins.; Gross Tonnage, 6,994;  
Funnel: Red, White Band, Black Top; Green Band on White.



**ZEELANDIA. Holland Lloyd.** Length, 440 ft. 7 ins.; Gross Tonnage, 7,995;  
Funnel: Yellow, Black Band.



**M.S. BARBARIGO. Società Veneziana.** Length, 440 ft. 7 ins.;  
Gross Tonnage, 5,293;  
Funnel: Black, Red Band between Two White.



**M.S. TJINEGARA. M.S. TJISADANE. Java-China-Japan Line.**  
Length, 440 ft. 6 ins.; Gross Tonnage, 9,227;  
Funnel: Black.



**HILDEBRAND. Booth Line.** Length, 440 ft. 3 ins.; Gross Tonnage, 6,995  
Funnel: Black.



**ELYSIA. Anchor.** Length, 440 ft.; Gross Tonnage, 6,368;  
Funnel: Black.



**M.S. ERRIA.** East Asiatic Co. Length, 440 ft. 3 ins. ; Gross Tonnage, 8,636.



**M.S. PACIFIC RELIANCE. M.S. PACIFIC ENTERPRISE. M.S. PACIFIC RANGER.**  
Furness Withy. Length, 435 ft. ; Gross Tonnage, 6,570 ;  
Funnel : Black, Red, Thin Black and Red Band, Black Top.



**M.S. GLENAMOY.** Glen Line. Length, 435 ft. ; Gross Tonnage, 7,269 ;  
Funnel : Red, Black Top.



**CITY OF NORWICH.** Ellerman (Hall Line). Length, 434 ft. 3 ins. ; Gross Tonnage, 6,726 ;  
Funnel : Buff, White Band, Black Top.



**NAGINA.** British India S.N. Co. Length, 433 ft. ; Gross Tonnage, 6,651 ;  
Funnel : Black, Two White Bands.



**TJIBADAKA.** Java-China-Japan Line. Length, 433 ft. ; Gross Tonnage, 7,803 ;  
Funnel : Black.



**M.S. DUNSTER GRANGE.** Furness-Houlder. Length, 431 ft. 3 ins. ;  
Gross Tonnage, 9,494 ;  
Funnel : Black, Red Band with White Maltese Cross, Black Top.



**TAKADA.** British India S.N. Co. Length, 430 ft. 1 in.; Gross Tonnage, 6,949;  
Funnel: Black, Two White Bands, Black Top.



**M.S. WESTRALIA.** Huddart Parker. Length, 430 ft.; Gross Tonnage, 8,108;  
Funnel: Yellow.



**M.S. LEIGHTON.** M.S. LINNELL. Lamport and Holt. Length, 430 ft.; Gross Tonnage, 7,412;  
Funnel: Light Blue, White Band, Black Top.



**M.S. UPWEY GRANGE.** M.S. EL ARGENTINO. Furness-Houlder.  
Length, 430 ft.; Gross Tonnage, 9,100;  
Funnel: Black, Red Band with White Maltese Cross, Black Top.



**HARDWICKE GRANGE.** Furness-Houlder. Length, 430 ft.; Gross Tonnage, 9,005;  
Funnel: Black, Red Band with White Maltese Cross, Black Top.



**BRITISH INVENTOR.** British Tanker Co. Length, 430 ft.; Gross Tonnage, 7,101;  
Funnel: Red, White Band, Black Top; Green Band on White.



**ANTONIO LOPEZ.** Compañía Trasatlántica. Length, 430 ft.; Gross Tonnage, 5,975;  
Funnel: Black.





**MARQUESA. BARONESA. DUQUESA. PRINCESA. CANONESA. Furness-Houlder.**  
 Length, 430 ft. ; Gross Tonnage, 8,972 to 8,286 ;  
 Funnel : Black, Red Band with White Maltese Cross, Black Top.



**M.S. COLOMBIA. Royal Nederlands Line.** Length, 429 ft. 5 ins. ;  
 Gross Tonnage, 10,782 ;  
 Funnel : Black, Two White Bands.



**M.S. BUENOS AIRES. M.S. CANADA. M.S. BALBOA. Axel Axelson Johnson.**  
 Length, 426 ft. 9 ins. ; Gross Tonnage, 5,614 to 5,524.



**M.S. IRISBANK. Bank Line.** Length, 426 ft. 7 ins. ; Gross Tonnage, 5,626 ;  
 Funnel : Yellow, Black Top.



**BAYANO. CAMITO. CORONADO. ARIGUANI. CARARE. CAVINA. Elders and Fyffes.** Length, 425 ft. 5 ins. ; Gross Tonnage, 6,611 to 6,907 ;  
 Funnel : Buff, Black Top.



**M.S. ALSIA. East Asiatic Co.** Length, 425 ft. 2 ins. ; Gross Tonnage, 5,812.



**M.S. EURYBATES. Blue Funnel Line.** Length, 425 ft. ; Gross Tonnage, 6,400 ;  
 Funnel : Blue, Black Top.



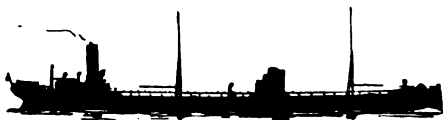
**STOCKWELL.** *Anchor-Brocklebank Line.* Length, 425 ft.; Gross Tonnage, 5,643;  
Funnel: Black, Blue and White Band, Black Top.



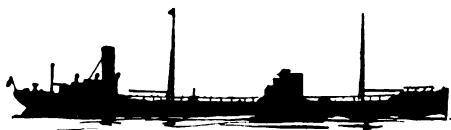
**CAIRROSS.** *Cairn Line.* Length, 425 ft.; Gross Tonnage, 5,494;  
Funnel: Black, White Triangle on Red Band.



**KARAGOLA.** *KHANDALLA.* *British India S.N. Co.* Length, 425 ft.; Gross Tonnage, 7,053;  
Funnel: Black, Two White Bands, Black Top.



**TUSCARORA.** *Anglo American Oil Co.* Length, 425 ft.; Gross Tonnage, 7,106;  
Funnel: Red, Black Top.



**M.S. NARRAGANSETT.** *Anglo American Oil Co.*  
Length, 425 ft.; Gross Tonnage, 6,889;  
Funnel: Red, Black Top.



**M.S. MEGARA.** *M.S. MIRZA.* *Anglo-Saxon Petroleum Co.* Length, 423 ft.;  
Gross Tonnage, 7,992 and 8,004;  
Funnel: Buff, Black Top.



**MANUEL CALVO.** *Compañía Trasatlántica.* Length, 421 ft.; Gross Tonnage, 5,617;  
Funnel: Black.



**KAROOLA.** McIlwraith, McEacharn. Length, 420 ft. 5 ins.;  
Gross Tonnage, 7,391;  
Funnel: Red, Black Top.



**MARAMA.** Union Steamship Co. of N.Z. Length, 420 ft. 3 ins.; Gross Tonnage, 6,497;  
Funnel: Red, Black Top.



**SAN EDUARDO. SAN SILVESTRE. SAN TIRSO. SAN VALERIO. SAN ZEFERINO.**  
Eagle Oil Transport Co.  
Length, 420 ft. 2 ins.; Gross Tonnage, 6,220;  
Funnel: Black, Yellow Band, Black Eagle, Black O on White Band, Yellow Band.  
**SAN RICARDO.** Cia. Navigazione San Ricardo.



**ALNMOOR. BLYTHMOOR. CASTLEMOOR.** Runciman. Length, 420 ft.;  
Gross Tonnage, 6,573;  
Funnel: Black, White Band, Blue R.



**PATUCA.** Elders and Fyffes. Length, 417 ft. 2 ins.; Gross Tonnage, 6,103;  
Funnel: Buff, Black Top.



**D'ENTRECASTEAUX. FORBIN.** Chargeurs Réunis. Length, 417 ft.; Gross Tonnage, 7,291;  
**DUPLEIX.** " " " " 7,135;  
**ANGO.** " " " " 416 ft.; " 7,110;  
**BOUGAINVILLE.** " " " " " 7,110;  
Funnel: Yellow, Red Stars on White Band.



**LADY DRAKE. LADY HAWKINS. LADY NELSON.** Canadian National (West Indies) Steamships. Length, 415 ft.; Gross Tonnage, 7,650;  
Funnel: Red, White Band, Blue Top.



**LADY RODNEY. LADY SOMERS.** Canadian National Steamships. Length, 415 ft.; Gross Tonnage, 7,650;  
Funnel: Red, White Band, Blue Top.



**MUNARGO.** Munson Steamship Co. Length, 415 ft.; Gross Tonnage, 6484;  
Funnel: Blue, White Band, Black Top.



**BELVEDERE.** Cosulich Line. Length, 412 ft.; Gross Tonnage, 7,420;  
Funnel: Red, White Band, Black Top.



**FORT ST. GEORGE.** Furness Withy. Length, 411 ft. 3 ins.; Gross Tonnage, 7,785;  
Funnel: Black, Red, Thin Black and Red Bands, Black Top.



**ERINPURA.** British India S.N. Co. Length, 411 ft.; Gross Tonnage, 5,128;  
Funnel: Black, Two White Bands, Black Top.



**CLAN MACNAB. CLAN MACNAIR. CLAN MACNAUGHTON. CLAN MACNEIL. CLAN MONROE. CLAN MORRISON. CLAN MURDOCH. CLAN MURRAY.** Clan Line. Length, 410 ft. 6 ins.; Gross Tonnage, 6,114;  
Funnel: Black, Two Red Bands.



**BUENOS AIRES.** *Compañía Trasatlántica.* Length, 410 ft. 6 ins. ; Gross Tonnage, 5,311;  
Funnel : Black.



**MONTEVIDEO.** *Compañía Trasatlántica.* Length, 410 ft. 5 ins. ; Gross Tonnage, 5,205 ;  
Funnel : Black.



**ZEALANDIA.** *Huddart, Parker.* Length, 410 ft. ; Gross Tonnage, 7,000 ;  
Funnel : Yellow.



**MEDIA.** *Anchor-Brocklebank.* Length, 410 ft. ; Gross Tonnage, 5,437 ;  
Funnel : Black, Blue and White Band, Black Top.



**OCEAN PRINCE.** *Furness Withy.* Length, 410 ft. ; Gross Tonnage, 5,212 ;  
Funnel : Black, Red, Thin Black and Red Bands, Black Top.



**ELLENGA.** *British India S.N. Co.* Length, 410 ft. ; Gross Tonnage, 5,196 ;  
Funnel : Black, Two White Bands, Black Top.



**DRAMATIST.** *Harrison Line.* Length, 410 ft. ; Gross Tonnage, 5,443 ;  
Funnel : Black, Red Band between Two White.



**JAMAICA MERCHANT.** Jamaica Direct Fruit Line. Length 405 ft.; Gross Tonnage, 7,381;  
**JAMAICA PLANTER.** " " " " 413 ft.; " 7,493;  
**JAMAICA PRODUCER.** " " " " 413 ft.; " 7,490;  
**JAMAICA SETTLER.** " " " " 413 ft.; " 7,490;  
 Funnel: Blue, Two White Bands, Black Top.



**M.S. LOUISIANA.** Det Forenede Dampskibs Selskab. Length, 407 ft. 8 ins.  
 Gross Tonnage, 6,513;  
 Funnel: Flamingo, Red, Black Top.



**NEWFOUNDLAND.** NOVA SCOTIA. Warren Line (Furness Withy). Length, 405 ft.;  
 Gross Tonnage, 6,820;  
 Funnel: Black, Red, Thin Red and Black Bands.



**M.S. GLENLUCE.** Glen Line. Length, 405 ft.; Gross Tonnage, 6,755;  
 Funnel: Red, Black Top.



**BREDA.** Koninklijke Nederlandsche Stoomboot Mij. Length, 402 ft. 6 ins.;  
 Gross Tonnage, 6,906;  
 Funnel: Black, Two White Bands.



**CAIRNESK.** CAIRNGLEN. Cairn Line. Length, 401 ft. 9 ins.;  
 Gross Tonnage, 5,007 and 5,019;  
 Funnel: Black, White Triangle on Red Band.



**HALIZONES.** Houston Line. Length, 400 ft. 8 ins.; Gross Tonnage, 5,273;  
 Funnel: Red, Two Black Bands, Black Top.



**ABINSI.** Elder Dempster. Length, 400 ft. 5 ins. ; Gross Tonnage, 6,365 ;  
Funnel : Buff.



**MANISTEE. PATIA. ZENT.** Elders and Fyffes. Length, 400 ft. 2 ins. ; Gross Tonnage, 5,360 ;  
Funnel : Buff, Black Top.



**EDAVANA.** British India S.N. Co. Length, 400 ft. ; Gross Tonnage, 5,284 ;  
Funnel : Black, Two White Bands, Black Top.



**BADAGRY. BARRACOO. BASSA. BATA. BATHURST. BEREBY. BIAFRA.**  
**BODNANT. BOUTRY. BOMA. BURUTU.** Elder Dempster.  
Length, 400 ft. ; Gross Tonnage, 5,300 ;  
Funnel : Buff.



**M.S. DOLIUS. M.S. MEDON.** Blue Funnel Line. Length, 400 ft. ; Gross Tonnage, 5,700 ;  
Funnel : Blue, Black Top.



**ORANGEMOOR. FERNMOOR.** Runciman. Length, 399 ft. 6 ins. ; Gross Tonnage, 6,573 ;  
Funnel : Black, White Band, Blue R.





**CAIRNDHU. CAIRNGOWAN.** Cairn Line. Length, 399 ft. 3 ins., and 400 ft.;  
Gross Tonnage, 5,250 and 5,295;  
Funnel: Black, White Triangle on Red Band.



**M.S. OLJAREN.** Transatlantic S.S. Co. Length, 389 ft.; Gross Tonnage, 5,482;  
Funnel: Yellow, Black Top.



**BRITANNIA. SUECIA.** Swedish Lloyd. Length, 375 ft.; Gross Tonnage, 4,500;  
Funnel: White; Yellow Star on Blue Disc, Black Top.



**M.S. STELLA POLARIS.** Bergen Steamship Co. Length, 360 ft.; Gross Tonnage, 5,020;  
Funnel: Yellow.



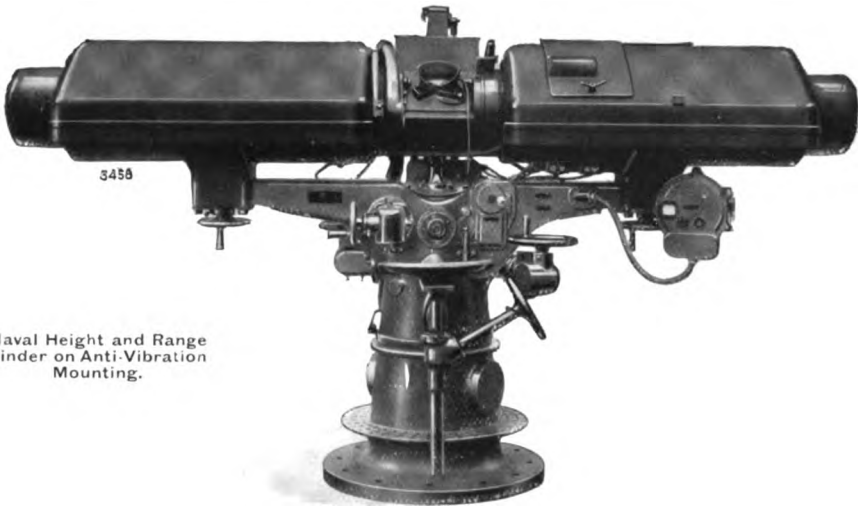
**BEN MY CHREE.** Isle of Man Steam Packet Co. Length, 355 ft.; Gross Tonnage, 2,586;  
Funnel: Red, Black Top.



**CANTERBURY.** Southern Railway. Length, 329 ft.; Gross Tonnage, 2,912;  
Funnel: Buff, Black Top.







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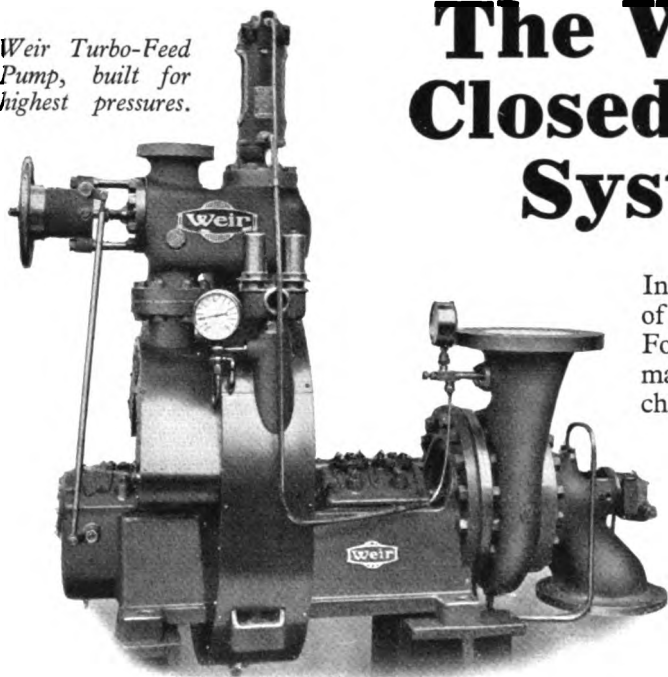
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N.B.—Editorial Communications should be addressed c/o The Publishers, 94 Jermyn Street, London, S.W.1.

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*b.* battleship; *b.cr.* battle cruiser; *cr.* cruiser; *a.cr.* armoured cruiser; *air.c.* aircraft carrier; *air.t.* aircraft tender; *f.l.* flotilla leader; *l.cr.* light cruiser; *cr.m.l.* cruiser minelayer; *s.cr.* scout cruiser; *s.cl.cr.* second-class cruiser; *tr. cr.* training cruiser; *d.* destroyer; *t.b.* torpedo boat; *f.cl.d.* first-class destroyer; *t.b.d.* torpedo-boat destroyer; *c.d.* coast defence ship; *sea.p.c.* seaplane carrier.

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*b.* battleship; *b.cr.* battle cruiser; *cr.* cruiser; *a.cr.* armoured cruiser; *a.t.* aviation transport; *air.c.* aircraft carrier; *f.l.* flotilla leader; *l.cr.* light cruiser; *cr.m.l.* cruiser mine layer; *sev.p.c.* seaplane carrier; *s.cr.* scout cruiser; *s.cl.cr.* second-class cruiser; *d.* destroyer; *t.b.d.* torpedo-boat destroyer; *c.d.* coast defence ship.

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